2011 HOUSE AGRICULTURE

HB 1459

2011 HOUSE STANDING COMMITTEE MINUTES

House Agriculture Committee

Peace Garden Room, State Capitol

HB 1459
February 10, 2011
Job #14321

☐ Conference Committee

Committee Clerk Signature Pe Mae Kuehn

Explanation or reason for introduction of bill/resolution:

Relating to subsurface drainage of water

Minutes:

Representative Belter, Co-Sponsor: This bill is about easing the process of getting a tiling permit. Currently those applying for a permit must first send the permit to the State Water Commission. Because of the tremendous interest in tiling, the commission has a heavy load and it will become heavier. They don't have the resources nor is it necessary that we start with the State Water Commission in the permit process. We can bring that back to the local level at the local water board. If they have any question about any project being of state significance, they can send that permit to the State Water Board for their analysis.

When we had the commodity reports and the State Board of Agricultural Research and Education report, their second priority was soil health and land management. Saline and sodic soils affect 25 percent (12.6 million acres) of North Dakota agricultural land. Many land managers are considering extensive land modification such as tiling to deal with the issue of nonconventional cover crop as a means of improving soil health.

Tiling is the latest new evolution of technology. Unfortunately in North Dakota we are 100 years behind. Usually we don't have enough moisture. With the excessive rainfall these past years, soils are becoming salty. There are acres that never showed salt before are now showing salt. Tiling allows us to remove excess water giving soil the capacity to hold water. When this water is filtered through the tiling system, it cleanses the soil. More people are trying to manage their nitrate levels. Our land will dry out sooner to allow equipment to go in and make split applications of nitrogen which is important in the management of nutrient levels.

When we watch the markets, we used to hear that Peoria, Illinois received six inches of rain along with other areas of the country. Our first thought was that the markets are going up because planting is going to be delayed. Then one or two days later we find out the planters are in the field in the corn belt and ours are sitting a week or more before we can turn a wheel. The reason they are able to move is because they are tiled which allows their land to deal with the water levels.

This bill will require the State Water Commission to come up with a uniform application for all people requesting a permit. That application will be sent to the local water board. If they determine a possibility that it could have state significance, then the water board has the ability to send that to the State Water Commission for their analysis.

The bill also requires the permittee to notify downstream interests 30 days in advance if they are within one mile of the site of the tiling. That gives them an opportunity to go to the water board to express their concerns. If the water board determines that easements are necessary, they can require those easements. The bill also has language that if there isn't a damage reason for not issuing a permit, the water board is required to issue a permit. There are some instances with cases of a water board member who doesn't believe in tiling and will not issue the permit. There has to be a reason for not issuing a permit. You do not need an easement if you are draining into an assessment drain, natural water course, pond, slew, or lake. Farmers may create their own pond to allow water to move. If anyone tiles without a permit and there is downstream damage caused, they will be held responsible. You can tile up to 80 acres without a permit. It is an actual 80 acres of land area.. It is not a watershed 80 acres.

Representative Holman: What is the significance of choosing 80 acres and the 1 mile notification?

Representative Belter: The significance of 80 acres, currently now you can surface drain 80 acres without a permit. So if you can surface drain, why not go out and tile 80 acres without a permit. The great thing about tiling, it allows your land to absorb moisture. We just did a tiling project on our farm which has the capability of draining 3/8 of an inch in a 24-hour period. When you get a couple of inches of rain and how much surface drainage runs off a quarter section of land compared to tiling of 3/8 inch in 24 hours. The ability to hold more water and drain it off over a long period of time has tremendous significance to flooding problems.

The 1-mile notification: at some place you have to draw a line. If you leave it unlimited, how far downstream can people declare there is a problem? This way it keeps that process near the tiling project and gives a guideline to the water board.

Representative Mueller: In the hog house amendment we reference ponds, slews and lakes as to where the water can drain. Is this new or already in code?

Representative Belter: I will refer that to Mike Dwyer. I think that is current language.

Senator Wanzek, Co-Sponsor: As I learn more about this practice, the more convinced I am that it is a win-win deal. The perceptions most of us have are contrary to the facts when you learn about it. It could help alleviate some downstream flooding. We are not draining wetlands. We are talking about managing water on land we already farm. When we get a heavy rain and the land is already saturated with water, we have the run off downstream and a flash type of flood. When tile is in, the impact downstream is lessened with less erosion. There is increased productivity and the ability to reduce erosion. The benefits far outweigh the negatives.

Representative Headland, Co-Sponsor: Introduces Brian Hefty, Host of AG PhD TV show.

Brian Hefty, Farmer near Sioux Falls, SD, Co-Owner of Hefty Seed Company, Co-host of Ag PhD:
(See attached #1 for powerpoint presentation)

Showed sample of drain tile which is a round black pipe with perforations and is buried at a depth of three feet. Farmers can lay tile themselves. It lowers the water table. The only time this tile line runs is if the water table is above the tile line.

Just to show you how simple it is for a farmer to tile himself:
Refers to card provided which is a slide rule to calculate slope and number of acres to drain. Also included are a DVD "Tiling Basics" which is 7 minutes long and a DVD "Field Tile Planning & Installation" which is 3 hours long.

Surface drainage means all the rainfall will move off in maybe an hour. That is where we get flash floods. When we can tile and lower the water table, we now have holding capacity in our soil. Tile can be put in any soil. Fine sand or silt may need a different type of tile or even a sock around the tile. Most tile designs work as long as the water is running down hill.

Drainage water management systems can shut the flow of tile off at any time.
In our county in South Dakota the farmer has to turn in his GPS maps to the county. Now there is record in the county to find it years later if needed.

Almost 10% of our acres are lost to prevented plant. There are three university studies that prove tiling will reduce erosion. (See page 11 of attached #1) Tiling will not pollute the water. The number one problem with water quality in the United States is phosphorus. Phosphorus is virtually immobile in soil. Farmers have to apply phosphorus. Most of it is in the top few inches of the soil. These tile lines are several feet down into the soil. Water quality tests out of tile lines will show no phosphorus. Sediment yield is reduced. Occasionally nitrates can be higher because they are negatively charged and soil is negatively charged. So nitrates are not held by soil very well. If farmers have light soil they have to be careful. Nitrogen costs money so being able to split-apply is helpful. Other technology to help retain nitrogen is nitrogen stabilizers.

If you wanted to provide more funding legislatively, give it to the NRCS for a short amount of time so they can get some of these site inspections done. Right now it is unfair for a farmer to go in and say "I would like to put in tile." NRCS says we'll get back to you in a couple of years. NRCS has been holding up a lot of drainage in the State of North Dakota and a lot of tiling. Farmers then view NRCS as the complete enemy to tiling.

Representative Trottier: What will drain tile do for easements for rural electric and rural water?

Brian Hefty: There are a lot of water and rural electric lines in the soil already. That is why we turn in maps and GPS information. Rural water and power don't care about tile lines. Occasionally they will tear through them and the farmer has to fix them.

Representative Trottier: If you drain a whole quarter, will that help my quarter next to you? How far out does it reach?

Brian Hefty: It helps on the edge of the field. When they see the success, everyone starts working together.

Representative Holman: What is the longevity of installation?

Brian Hefty: Years ago there was clay tile and cement tile. With new tile and modern installation, we expect most tile lines to last 60-80 years.

Chairman Johnson: With the perpetual easements on the wetlands, if tiling a field with an easement on it, how far do you have to stay back from the wetlands?

Brian Hefty: It is completely subjective. So if you get the right NRCS agent on the right day you may be able to tile what wouldn't otherwise be possible. We try to coach farmers on what to say and do.

Representative Boe: With the extra funding needed for NRCS, do you believe it is lack of staff or lack of interest?

Brian Hefty: There are some NRCS agents who don't believe in tiling. They haven't fully educated themselves. There are other agents who want to make a difference but the backlog has gotten so great. I think it is a little of both.

Representative Boe: Years ago we had scope and affect. Are we done?

Brian Hefty: If a farmer has had his wetlands determinations done, then he could be done if he agrees with the determination. Ninety-nine percent of farmers don't agree with them so they want the determinations redone now.

Representative Rust: You said you put this tile 3 to 4 feet in the ground. How far apart is each line?

Brian Hefty: University of Minnesota has guidelines. If it is heavy soils, place them 35-70 feet. In lighter soils it might be 100 feet apart. Some farmers will start at 100 foot spacings in a field and split it later.

Brad Thykeson, Vice President from ND Grain Growers: (See attached #2) I bought a tile plow in 2009. We have 550 acres currently tiled. It is not drainage as much as it is water management. This last year we were able to harvest the corn of our first tiled quarter. I saw about a 50 bushel increase. With today's corn prices that has an economic impact.

Bob Bahm, Minot, Farms and owns a soils laboratory since 1982: The United States Department of Agriculture in Mandan has done extensive research in saline and haven't had much success. Here we have a solution that will bring production back.

I was on the NRCS board in Minot for 13 years. We were always told on the board that it was locally led. After 13 years, if it didn't come from Washington in the big book it didn't seem like what we were trying to promote did. Due to no-till and minimum-till farming, we are holding water on the surface and created another problem. The meetings in Washington, in wheat production, for the world population of all the wheat produced in the last 50 years, we have to double that in the next 50 years to stay even. In our area we feel we have lost 10-20 percent of production in the last couple of years just from the little swales in the field.

Gerald Melvin, Farms near Buffalo: We are two feet below highest point in Cass County. In 2005 our farm registered the most rainfall of any point in North Dakota that was sent into Atmospheric Resource. That year our farm was preventive plant. We didn't get on that ground until July. We went through the permitting to get our ground drain tiled. An example, if you have land point A and Farmer B has land at the next point. If a horseshoe would come through in the form of a ravine, and you put drain tiled water into that ravine, he could stop that. This alleviates that problem. Our family came from Illinois. As a boy I would see water coming through these clay tiles into the natural water ways. The way to get it through to the neighbors is for them to realize that the guys with the highest yields are the ones with the drain tile. They are then pumping the cash rent up which is $400/acre in some areas.

Chairman Johnson: Did you start this tiling process yourself?

Gerald Melvin: We hired it to be done. The firm was in business since 1968. It took them 2 weeks for 300 acres. We wanted it done right and didn't have time to do it.

Chairman Johnson: Is that recent, so you haven't cropped it yet.

Gerald Melvin: We did it in 2007. So we took crops off in 2008, 2009, and 2010. We invited one of the bankers to see it. He could not believe the consistency of the corn from one end to the other. We had test plots out there in 2006. The guy that put the plots in got off after the second round because he didn't want to walk through water to get out of here. Tiling can be an advantage in both clay and light soils.

John Paczkowski, Office of the State Engineer, Chief of the Regulatory Section: (See attached #3)
Testifying on behalf of Todd Sando. The Office of the State Engineer is willing to assist. Tile drainage accounts for roughly 80-85% of applications. Tile drainage has been going on for a number of years in the state. We have about 400-500 drain tile applications that have been processed.

Representative Holman: How long does it take to process an application?

John Paczkowski: The way the process works now is the State Engineer's office receives the permit applications. Once they are complete, we put them into a central data base. The only other task the State Engineer's office has is determining whether they are state-wide or district significance. If not, it goes to the water boards. The water boards are the permitting agencies. The State Engineer's office is out of the loop.

Michael Schnell, Manage Marketing & Government Affairs for Ellingson Companies: (See attached #4a)
I have included two handouts. One is a 2009 resolution from the Red River Joint Water Resource District. (See attached #4b) The other one is a 1904 booklet from the United States Department of Agriculture that talks about tile drainage and the benefits. I've included it to show you that this is not new technology. It has been done across the United States for over 100 years. HB1459 isn't about water, it is about good government.

Tom Lilga, Executive Director of the ND Corn Growers Assn.: Last week we heard SB2342 which is a related bill. There was a farmer that testified named Dave Henke from Grafton. He made three main points on how these bills are trying to address the problem. Three problems he saw are:

1. Flowage easement rejections
2. Inhibiting progress and land values and taxation values
3. There was no recourse for the downstream people with the perpetual easements

As long as this legislation is addressing these main points, from the Corn Growers' standpoint, we are in favor of this.

Mike Dwyer, ND Water Resource District Assn. (all the water boards):
We have worked with Rep. Belter for the amendments. We think we have a system that is streamlined, does the job, and will make this a workable system.

Richard Schlosser, ND Farmers Union: A couple years ago at our annual meeting the discussion on salinity and problems it has created in North Dakota came up in our policy debate. We have worked with the amendment from Representative Belter. We support this bill as amended.

Jeff Missling, ND Farm Bureau: We also support HB 1459.

2011 HOUSE STANDING COMMITTEE MINUTES

House Agriculture Committee
Peace Garden Room, State Capitol

HB 1459
February 17, 2011
Job # 14657

☐ Conference Committee

Committee Clerk Signature Pe Mae Kuehn

Explanation or reason for introduction of bill/resolution:

Committee Work—relating to subsurface drainage of water

Minutes:

Representative Headland: Moved amendment LC #11.0677.02002

Representative Schmidt: Seconded the motion

Chairman Johnson: Were these your amendments Representative Belter?

Representative Belter: Yes. It is a hoghouse of the bill.

Voice Vote taken. Amendment passed

Representative Headland: Moved Do Pass as amended on HB 1459

Representative Schatz: Seconded the motion

Representative Mueller: I have begun to hear some rumblings about some of the issues this could cause. Some of the local water boards have reservations. They weren't here and I asked them why not. I didn't get a good answer.

Chairman Johnson: We are getting some bills from the Senate that will mirror this.

Representative Belter: Senator Luick's which passed the Senate with an emergency clause is identical to this bill. I did have a person come to me and said there was some rumblings from realtors that they were concerned we were going to flood the Red River Valley. I worked very closely on this amendment with Mike Dwyer from the Water Boards.

Representative Holman: Our drain boards were here for Senate hearings and on this bill. I have not heard any negatives yet.

Chairman Johnson: Through our hearing process and the media, it has sparked an interest in going forward with something like this.

A Roll Call vote was taken. **Yes: 14, No: 0, Absent: 0,**

DO PASS as amended motion carried.

Representative Headland will carry the bill.

Prepared by the Legislative Council staff for
Representative Belter
February 9, 2011

VK 2/17/11 1082

PROPOSED AMENDMENTS TO HOUSE BILL NO. 1459

Page 1, line 1, after "A BILL" replace the remainder of the bill with "for an Act to create and enact a new subsection to section 61-21-02 and a new section to chapter 61-32 of the North Dakota Century Code, relating to subsurface drainage of water; to provide a penalty; and to declare an emergency.

BE IT ENACTED BY THE LEGISLATIVE ASSEMBLY OF NORTH DAKOTA:

SECTION 1. A new subsection to section 61-21-02 of the North Dakota Century Code is created and enacted as follows:

The installation of artificial subsurface drainage systems.

SECTION 2. A new section to chapter 61-32 of the North Dakota Century Code is created and enacted as follows:

Permit to drain subsurface waters - Permit form - Penalty.

Installation of an artificial subsurface drainage system comprising eighty acres [32.37 hectares] of land area or more requires a permit. The state engineer shall develop an application form for a permit for subsurface drainage of water. A person seeking to construct an artificial subsurface drainage system must submit an application to the water resource district within which is found a majority of the land area for consideration and approval. Water resource districts may attach any necessary conditions to an approved permit, but may not deny an application unless the water resource district determines the application is of statewide significance or the proposed drainage will flood or adversely affect downstream landowners within one mile [1.61 kilometers] of the proposed subsurface drainage. Water resource districts must forward copies of all approved permits to the state engineer. Water resource districts shall determine if the application proposes drainage of statewide significance. If so, the application must be referred to the state engineer for consideration and approval, and the state engineer shall make a determination within thirty days. The permit applicant shall provide a thirty-day notice to downstream property owners within one mile [1.61 kilometers] of the proposed subsurface drainage. If an investigation by a water resource district or a downstream landowner within one mile [1.61 kilometers] shows that the proposed drainage will flood or adversely affect downstream landowners within one mile [1.61 kilometers], the water resource district may require flowage easements before issuing a permit. If an artificial subsurface drainage system drains into an assessment drain, natural watercourse, or pond, slough, or lake, a flowage easement is not required. Flowage easements must be filed for record in the office of the recorder of the county or counties in which the lands are situated. A person that installs an artificial subsurface drainage system without first securing a permit to do so, as provided in this section, is liable for all damage sustained by a person caused by the draining, and is guilty of an infraction.

SECTION 3. EMERGENCY. This Act is declared to be an emergency measure."

Renumber accordingly

Date: 2/17/11

Roll Call Vote # 1

2011 HOUSE STANDING COMMITTEE ROLL CALL VOTES

BILL/RESOLUTION NO. HB 1459

House **Agriculture** Committee

Legislative Council Amendment Number 11.0677.02002

Action Taken: ☐ Do Pass ☐ Do Not Pass ☐ Amended

☐ Rerefer to Appropriations

Motion Made By Representative Headland Seconded By Representative Schmidt

Representatives	Yes	No	Representatives	Yes	No
Dennis Johnson, Chair			Tracy Boe		
Joyce Kingsbury, Vice Chair			Tom Conklin		
Wesley Belter			Richard Holman		
Craig Headland			Phillip Mueller		
David Rust					
Mike Schatz					
Jim Schmidt					
Wayne Trottier					
John Wall					
Dwight Wrangham					

Voice Vote
Amendment passed

Total Yes No

Absent

Bill Carrier

If the vote is on an amendment, briefly indicate intent:

Hog House amendment

Date: 2/17/11

Roll Call Vote # 2

2011 HOUSE STANDING COMMITTEE ROLL CALL VOTES

BILL/RESOLUTION NO. HB 1459

House **Agriculture** Committee

Legislative Council Amendment Number 11.0677.02002

Action Taken: ☒ Do Pass ☐ Do Not Pass ☒ Amended

☐ Rerefer to Appropriations

Motion Made By Representative Headland Seconded By Representative Schatz

Representatives	Yes	No	Representatives	Yes	No
Dennis Johnson, Chair	X		Tracy Boe	X	
Joyce Kingsbury, Vice Chair	X		Tom Conklin	X	
Wesley Belter	X		Richard Holman	X	
Craig Headland	X		Phillip Mueller	X	
David Rust	X				
Mike Schatz	X				
Jim Schmidt	X				
Wayne Trottier	X				
John Wall	X				
Dwight Wrangham	X				

Total **Yes** 14 **No** 0

Absent 0

Bill Carrier Representative Headland

If the vote is on an amendment, briefly indicate intent:

REPORT OF STANDING COMMITTEE

HB 1459: Agriculture Committee (Rep. D. Johnson, Chairman) recommends **AMENDMENTS AS FOLLOWS** and when so amended, recommends **DO PASS** (14 YEAS, 0 NAYS, 0 ABSENT AND NOT VOTING). HB 1459 was placed on the Sixth order on the calendar.

Page 1, line 1, after "A BILL" replace the remainder of the bill with "for an Act to create and enact a new subsection to section 61-21-02 and a new section to chapter 61-32 of the North Dakota Century Code, relating to subsurface drainage of water; to provide a penalty; and to declare an emergency.

BE IT ENACTED BY THE LEGISLATIVE ASSEMBLY OF NORTH DAKOTA:

SECTION 1. A new subsection to section 61-21-02 of the North Dakota Century Code is created and enacted as follows:

The installation of artificial subsurface drainage systems.

SECTION 2. A new section to chapter 61-32 of the North Dakota Century Code is created and enacted as follows:

Permit to drain subsurface waters - Permit form - Penalty.

Installation of an artificial subsurface drainage system comprising eighty acres [32.37 hectares] of land area or more requires a permit. The state engineer shall develop an application form for a permit for subsurface drainage of water. A person seeking to construct an artificial subsurface drainage system must submit an application to the water resource district within which is found a majority of the land area for consideration and approval. Water resource districts may attach any necessary conditions to an approved permit, but may not deny an application unless the water resource district determines the application is of statewide significance or the proposed drainage will flood or adversely affect downstream landowners within one mile [1.61 kilometers] of the proposed subsurface drainage. Water resource districts must forward copies of all approved permits to the state engineer. Water resource districts shall determine if the application proposes drainage of statewide significance. If so, the application must be referred to the state engineer for consideration and approval, and the state engineer shall make a determination within thirty days. The permit applicant shall provide a thirty-day notice to downstream property owners within one mile [1.61 kilometers] of the proposed subsurface drainage. If an investigation by a water resource district or a downstream landowner within one mile [1.61 kilometers] shows that the proposed drainage will flood or adversely affect downstream landowners within one mile [1.61 kilometers], the water resource district may require flowage easements before issuing a permit. If an artificial subsurface drainage system drains into an assessment drain, natural watercourse, or pond, slough, or lake, a flowage easement is not required. Flowage easements must be filed for record in the office of the recorder of the county or counties in which the lands are situated. A person that installs an artificial subsurface drainage system without first securing a permit to do so, as provided in this section, is liable for all damage sustained by a person caused by the draining, and is guilty of an infraction.

SECTION 3. EMERGENCY. This Act is declared to be an emergency measure."

Renumber accordingly

2011 SENATE AGRICULTURE

HB 1459

2011 SENATE STANDING COMMITTEE MINUTES

Senate Agriculture Committee
Roosevelt Park Room, State Capitol

(Engrossed) HB 1459
March 18, 2011

☐ Conference Committee

Committee Clerk Signature Greta Nelson

Explanation or reason for introduction of bill/resolution:

Relating to subsurface drainage of water; to provide a penalty; and to declare an emergency.

Minutes: Attachments: #1, #2, #3

Senator Flakoll; Meeting called to order this 18th day of March, 2011 (Engrossed) HB1459 Clerk take roll.

Clerk: 7-0

Senator Flakoll; Mike Schnell handed in written testimony as he was not able to attend.

Rep Belter : District 22 HB 1459 which is identical with SB 2280. Senator Luick bill. Tiling regulation ....expedites the paperwork process by allowing the local water board to make the decision of the approval of permits instead of sending them to the state engineer. The bill does provide that if the local water board does wants the state engineer to look at it first, that provision is in there. Requires the permit holder to notify downstream people 30 days in advance that they are applying for a permit. The water board can require easements if there is a problem. If anyone does tiling without a permit, the permit holder is liable.

Senator Murphy: Is the concern about the downstream person.

Rep Belter: Downstream people require you notify within one mile downstream that you are applying for a permit. They can come before the water board to protest if a problem or concern. They can go through legal procedures if necessary.

Dan Wogsland: Executive Director ND Grain Growers....supports the bill HB 1459 (Presented Vice President Brad Thykeson testimony Attachment #1)

John Paczkowski: Chief regulatory Section of Office of State Engineer (Attachment #2)

Senator Flakoll; Would you vote green or red?

Senator Larsen; The opposition of this ....science with this?

Senator Flakoll; If that were the case, would you rescind some of your concerns related to that topic part of it?

Mike McEnroe: Don't know if it applies to water treatment plant or in the drain and removes the nitrates or part of the treatment plant.....not sure of the process. If there is a health or cost concern to the downstream.

Senator Luick; Nitrate can be handled by anaerobic activity which there are different bark filters put in the outlining so if it does become a problem, there are ways to handle that. Do you have any reports on the contradictory conclusions about tiling?

Mike McEnroe: Many reports but not with me....they are online.

Senator Luick; We have high water problem in eastern state.....crop loss is getting worse....what is your recommendation for the repair of what is happening if you don't feel tiling is the right thing to do?

Mike McEnroe: I am saying it takes a proposed analysis to see what the impact is downstream. Concern about the county water resource does not have that expertise on staff. In any one project will not be a make or break. How do we get a handle on nummular impacts?

Senator Miller; Why do you believe all state tile drainage should be of significance?

Mike McEnroe: My recommendations were all tile systems in the eastern part of the state where we seem to have the predominant flooding problems.

Senator Miller; Why do you believe

Mike McEnroe: The state engineer's office has the expertise to look at impacts more than a water resource district does. Look at the cumulative impact rather than a project impact. Some don't have these specialists on the job.

Senator Miller; Why do believe there is a difference in drainage?

Mike McEnroe: Surface draining in Red River Valley in previous years. People can see the surface drainage. We don't know what is down there and what they are tapping into as an unknown.

Senator Miller; Your concern subsurface could affect wet lands?

Mike McEnroe; We are testifying for the concern of the downstream ....water quantity/quality. Tile is used in other states....not much in the wetlands in ND, but the use of tile will become more common.

Senator Miller; Are you aware the NRCS has to sign off on all these tiling process that go on?

Mike McEnroe: Yes, I am aware of and also aware of the science in the NRCS is using is debated and not conclusive in every case.

Senator Flakoll; How did your organization come to the position on this case...a resolution at a meeting.....roll call consensus?

Mike McEnroe: I represent our organization and asked if I would represent.

Senator Luick: Does your organization have a problem with creating a wet land at the end of the tile outlet?

Mike McEnroe: It would depend upon what the impacts are.

Cary Backstrand: Water Resource Districts of the State. No directions from the board....since I have been here I've been informed that water resource board has met and agreed to support the bill as written.

Senator Flakoll; Needs more refining.....permitting process. Provide some clarity.

Rep Belter: Permit turned in local water board, local water board makes a decision and determines if project is of state wide significance. If determined it not to be, they can act on it. If unsure they can send the permit to the state water commission just as it is done now. ....they want to get their recommendation. Under current rules the state water commission does not approve or disapprove a permit....they make an analysis of the permit and sends it to the local water board to help them in their decision. ....whether approve the permit.

Senator Flakoll; Close hearing.

2011 SENATE STANDING COMMITTEE MINUTES

Senate Agriculture Committee
Roosevelt Park Room, State Capitol

(Engrossed) HB1459
March 18, 2011
Job #15669

☐ Conference Committee

Committee Clerk Signature Greta Nelson

Explanation or reason for introduction of bill/resolution:

Relating to subsurface drainage of water; to provide a penalty; and to declare an emergency.

Minutes:

Senator Flakoll; Meeting called to order HB1459, March 18, 2011.

Senator Larsen: I move a Do Pass on 1459

Senator Klein; second

Senator Flakoll; Discussion

Senator Miller; The concerns that were brought forward will be an impact in the next two years while the study will flee to study these rules and laws that will maybe have a better way to handle this in the future. With this process, it is probably the only way to do it and know what will happen....trial an error.

Senator Larsen: The sooner the better and the faster we can get it done. The Devils Lake outlet gets open, we should open that up as well because is the way to stop the flooding.

Senator Luick; This may not be the perfect venue, but tiling has proven itself ....there are many benefits to it. As indicated, if we need to tweak something in two years, that is the time to do it.

Senator Flakoll: Mentioned in meeting yesterday about the Denmark trip, 95% of all the agriculture land in Denmark was tiled which some practices are more advanced than ours. Positions they need with the population situation is necessary to do those things.

Senator Flakoll; Clerk take the roll for a Do Pass to engrossed HB1459

Clerk: 7-0-0

John Paczkowski: We have no problem with the way the bill stands. A few considerations are what our thoughts are.

Senator Miller; Do you think this problem would be best solved in the interim if/when we have a study in another bill?

John Paczkowski: It would be an opportunity look at the process and be reviewed in the interim.

Senator Klein; Other states are so far ahead in the tiling issue. Have you conferred with other states?

John Paczkowski: No, have not been contact with other states.

Senator Klein; Could help to answer the questions you are asking .....help to answer where they are actively tiling.

Senator Larsen; With the Devils Lake outlet, completion of that project, do you see it would open up that area for more tiling permits?

John Paczkowski: As this bill stands, the permit process would go through the boards. Not altogether similar than what it is now. The only difference is the state engineer determines whether a state wide significance. If so, it would be a longer process....two applicants and they are hesitant because of the cost.

Senator Miller; 30 day requirement...?

John Paczkowski: We can make that determination whether state significance in sort time line. Concern is state engineer office required to make a determination within 30 days.

Scott Rising: Soybean Growers .....supports HB 1459 Little conflicted as most other ag areas in other states are very much ahead of us in this arena. They don't appear to have the same problems....if this piece of legislation is passed, before you meet again to tweak it, we are not going to have 80-90% of ND tiled anyway. I encourage you to press on with what we are doing. It is a loss of productivity without this bill. Please green light this.

Senator Flakoll; Opposition?

Senator Miller; Go on record supporting the HB 1459

Mike McEnroe: ND Chapter of Wildlife Society (Attachment #3)

Senator Larsen; On your testimony/red flags about nitrates .... A study not much done in ND but on the west coast where nitrate levels are high. I am not so concerned about the nitrate release of the tiling system as it can be captured with zlight media.

Mike McEnroe: You're speaking out of my realm of expertise.

Senator Flakoll; Passed HB 1459; 7-0-0

Senator Flakoll: Senator Luick carry bill

Senator Flakoll; Adjourned until Thursday

Date: 3/18/11

Roll Call Vote # 1

2011 SENATE STANDING COMMITTEE ROLL CALL VOTES

BILL/RESOLUTION NO. HB 1459

Senate Agriculture Committee

Legislative Council Amendment Number

Action Taken: ☒ Do Pass ☐ Do Not Pass ☐ Amended ☐ Adopt Amendment

☐ Rerefer to Appropriations ☐ Reconsider

Motion Made By Senator Larsen Seconded By Senator Klein

Senators	Yes	No	Senators	Yes	No
Chairman Flakoll	✓		Senator Heckaman	✓	
Vice-Chair Larsen	✓				
Senator Klein	✓				
Senator Luick	✓				
Senator Miller	✓				
Senator Murphy	✓				

Total (Yes) 7 No 0

Absent 0

Floor Assignment Senator Luick

If the vote is on an amendment, briefly indicate intent:

REPORT OF STANDING COMMITTEE

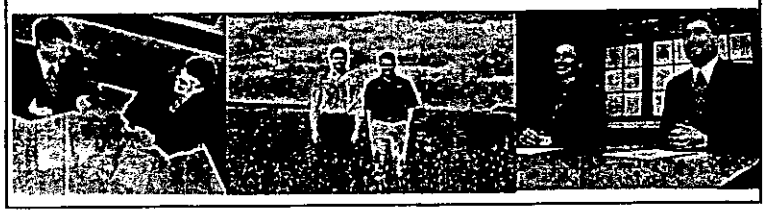
HB 1459, as engrossed: Agriculture Committee (Sen. Flakoll, Chairman) recommends **DO PASS** (7 YEAS, 0 NAYS, 0 ABSENT AND NOT VOTING). Engrossed HB 1459 was placed on the Fourteenth order on the calendar.

2011 TESTIMONY

HB 1459

Brian Hefty

Improving Water Management Means a Better Long-Term Future for North Dakota!



Brian's Background

- Lifelong farmer near Sioux Falls, SD
- Part-owner of Hefty Seed Company, 4 of our 30 stores are in North Dakota (Pembina, Jamestown, Mohall, and Lisbon)
- Co-host of Ag PhD since 1998, the nation's most-watched agronomy TV show
- Agronomist, working with farmers throughout the U.S. to produce better crops, more farm income, a healthier environment, and more food for the world

Water Management, The Bottom Line

- I believe that improving water management, with an emphasis on tiling, could add **$1 billion annually** to the state of North Dakota through increased crop yields, lower insurance costs, fewer road repairs, and reduced flooding damage to many communities.
- Much of the cost to improve water management would gladly be absorbed by farmers.

ND Crop Yield Loss

Approximate acreage (planted / affected):

- Corn – 2 million acres / 750,000 ac
- 750,000 X 25 bu loss X $5 = $93.75 mil
- Soybeans – 4 million acres / 1.3 million ac
- 1.3 mil X 10 bu loss X $13 = $169 mil
- Wheat – 7 million acres / 1.25 million ac
- 1.25 mil X 10 bu loss X $8 = $100 mil
- Sugarbeets – 220,000 acres / 150,000 ac
- 150,000 X 4 ton loss X $50 = $30 mil

Brian Hefty
HB 1459
#1

ND Prevented Plant

- Prevented Plant = On avg since 1995, 1.2 million acres annually according to ND FSA.
- Assume that cost equals potential revenue minus insurance payout.
- 1.2 mil ac X $200/ac loss = $240 million
- Also, because of all the prevented plant, yield loss, and crop loss in ND due to poor drainage, we believe insurance costs per acre are at least $10 too high.
- $10 X 22 million total crop acres = $220 mil

Poor Drainage Hidden Costs

- Farm Equipment Damage = $10 million
- Fuel, Oil, etc. for replanting = $5 million
- Seed, Chem, Fert for replanting = $20 million
- Labor Costs for replanting, farming around wet areas, etc. = $5 million
- More costs?????
- Total = at least $40 million

ND Water Management Costs

- Crop Loss (4 listed crops) = $392.75 million
- Additional Crop Loss (other crops on remaining 9 million acres) = $50 mil
- Prevented Plant = $240 million
- Crop Insurance = $220 million
- Hidden Costs = at least $40 million
  - Road Repairs = $20 million
  - Flooding Damage to Communities = $50 mil
  - TOTAL = $1.01 BILLION annually!

Water Management Issues

1. Increasing rainfall in some areas of North Dakota
2. Excess soil moisture negatively affecting crop yields because of higher soil pH levels, higher salt levels, reduced microbial activity, and a reduction of oxygen in the soil
3. Excess soil moisture preventing crops from being planted
4. Erosion leading to more sediment and phosphorus in waters
5. Flooding impact on communities

Water Management Issues

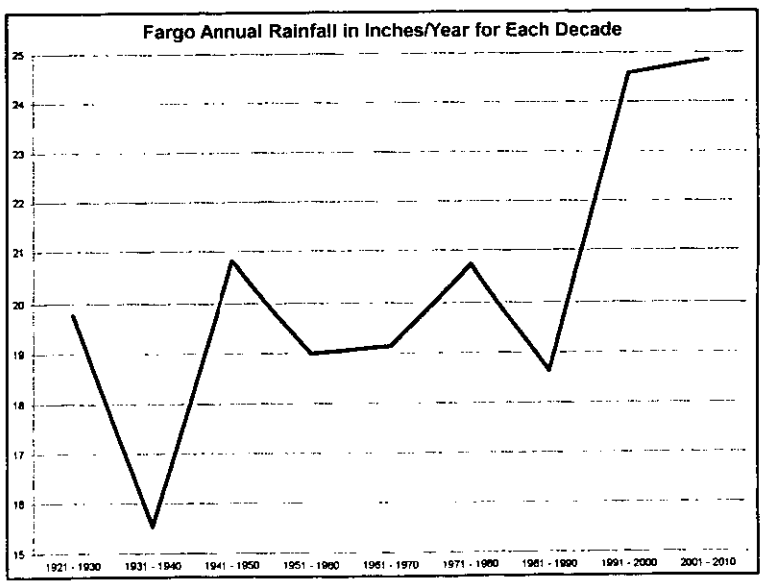
6. Flooding impact on roads
7. Inconsistent county drainage ordinances
8. For farmers who wish to remain in the USDA Farm Program, NRCS must inspect their land first to do a "Wetlands Determination". Unfortunately, farmers believe the process to be too subjective and too time-consuming, often taking 1 to 2 years to do a simple site inspection and evaluation.

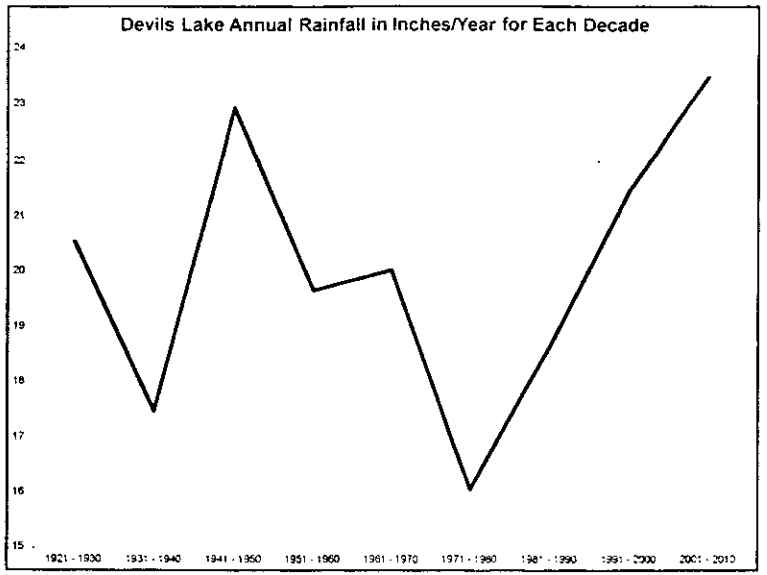
Water Management Issues

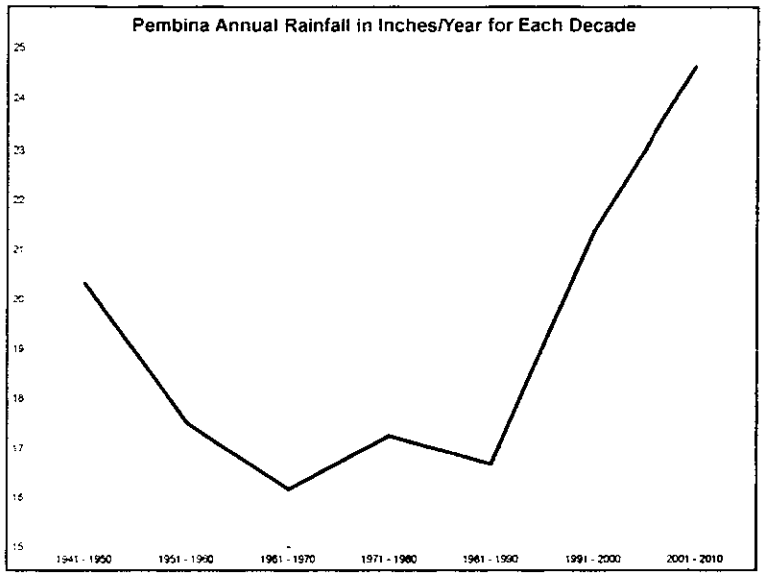
9. U.S. Fish & Wildlife has perpetual wetland easements on some farms. Many of these have been in effect for 40+ years, and through several landowners. There is currently no way to "buy out" of the easement. On farms with these easements, USF&W prevents drainage.
10. A lack of understanding about water management, tiling, and drainage in the government, the general public, the farm community, neighbors, and landowners

1 Increasing Rainfall in ND

- According to the North Dakota State Climate Office, rainfall has been increasing in many areas of North Dakota in recent years.
- Very simply put, systems that were designed to handle a certain amount of annual water are struggling when rainfall increases, especially with North Dakota's cooler climate and lower evaporation rate compared to states to the south.

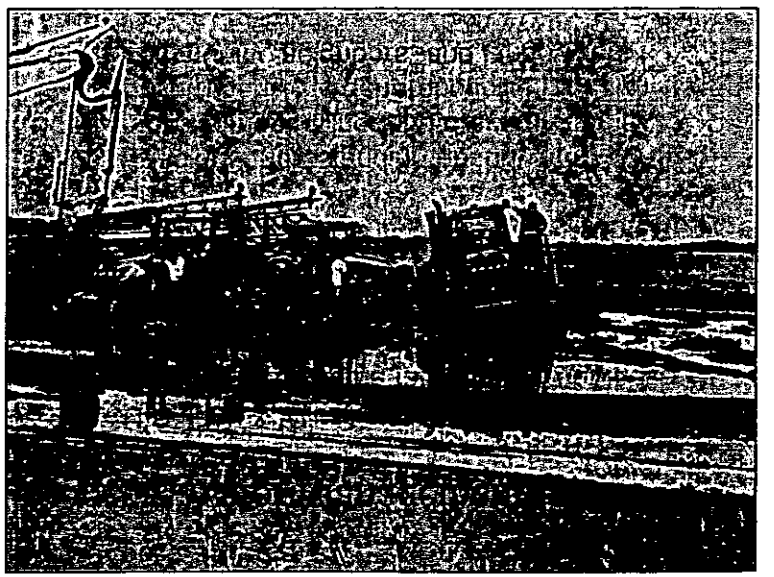


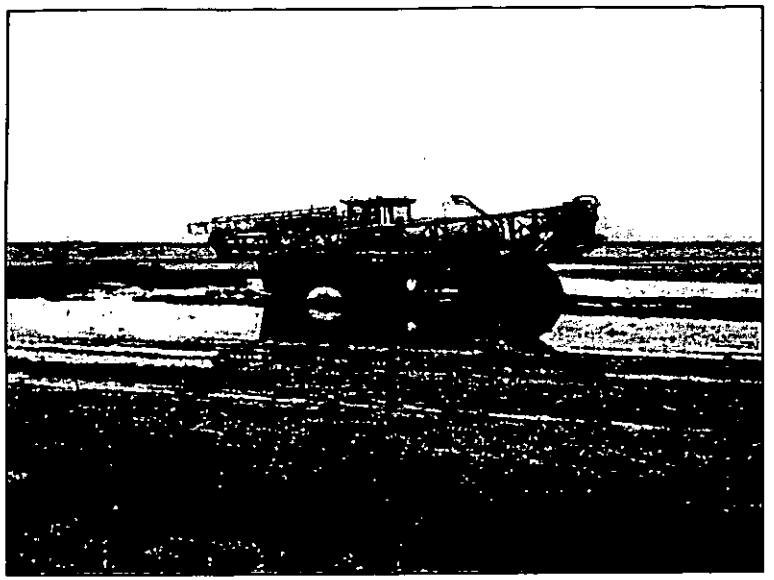


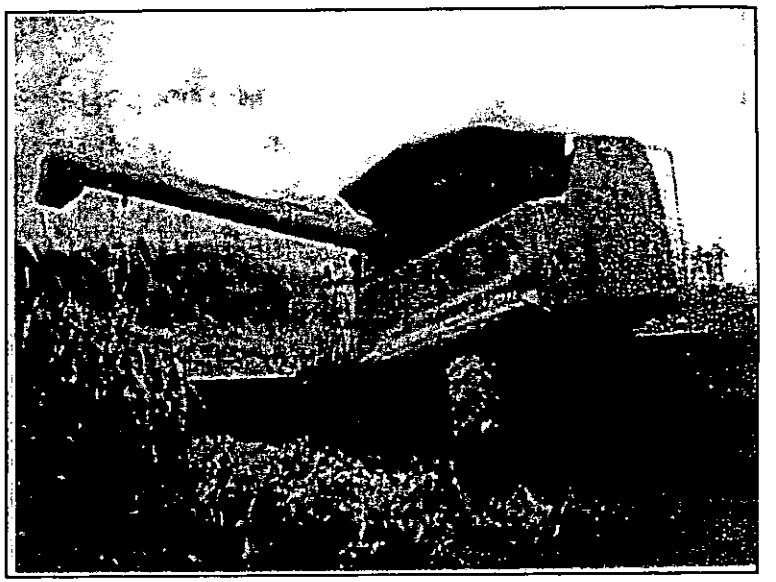


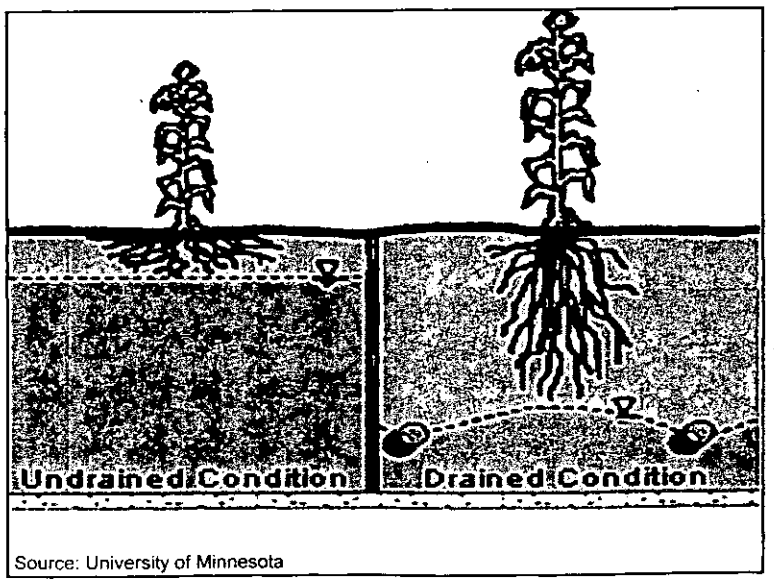
2 Poor Crop Yields

- Ideal soil composition is 50% dirt, 25% water, 25% air
- Too much water means the air percentage goes down
- Too much water kills soil microbes, stunts growth, and leads to significantly lower yields
- Also, over time if drainage is poor there will be little plant growth to use the water up, so the excess water issue becomes even worse

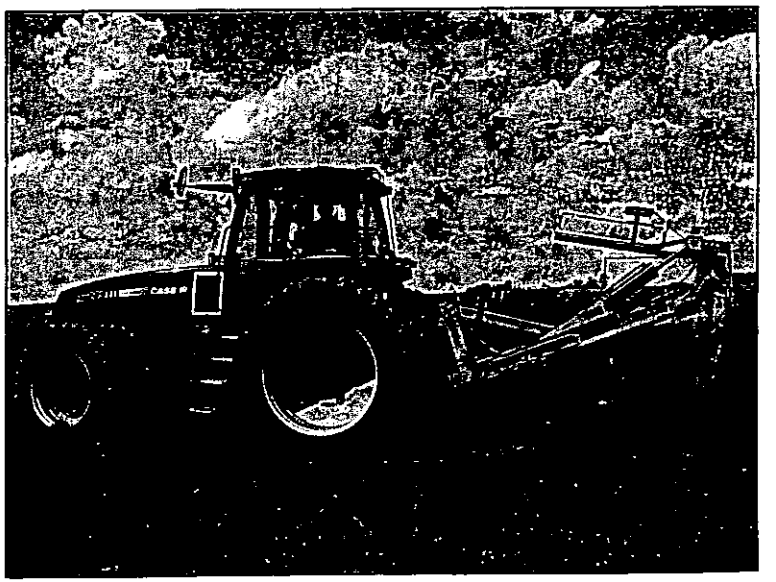


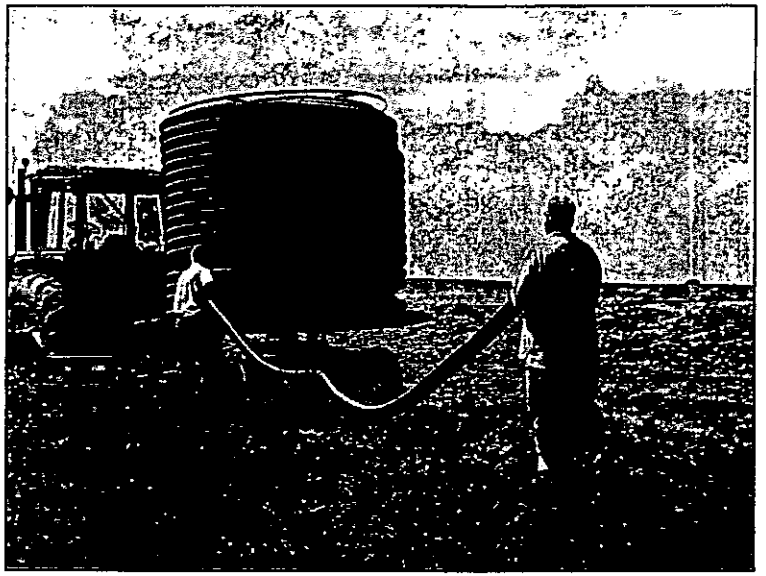


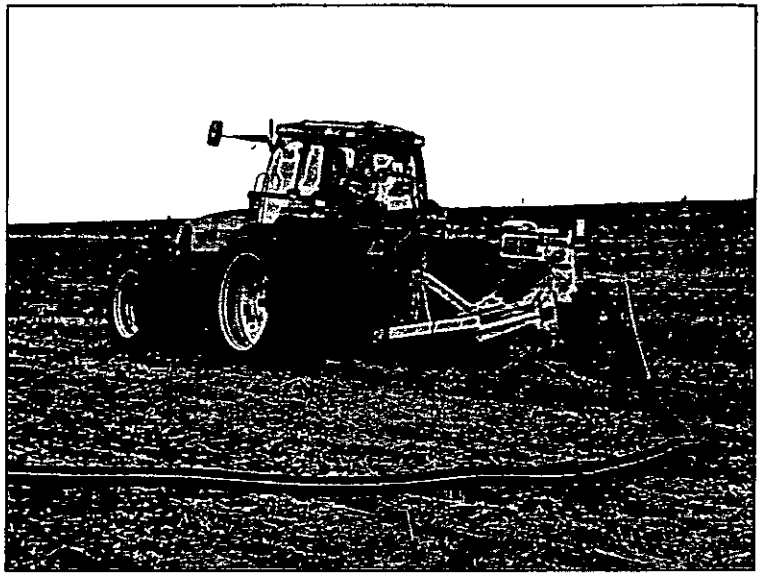




Source: University of Minnesota





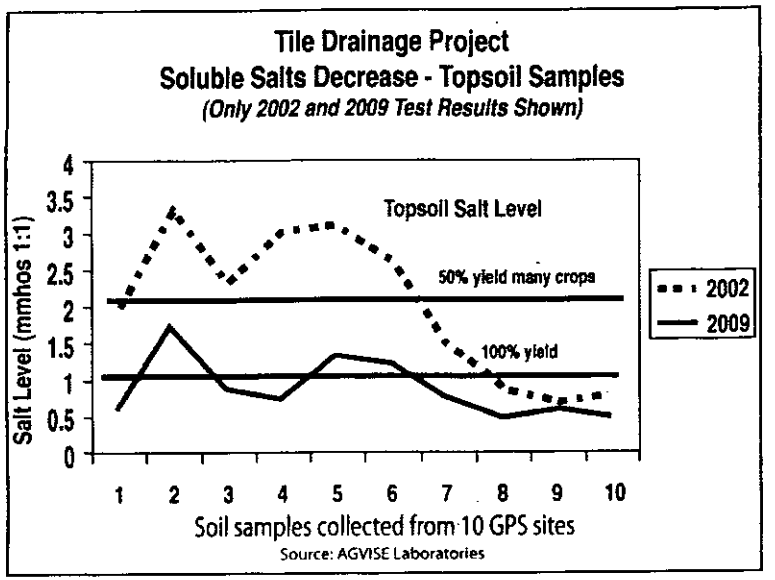


Why Tile?

- Higher yield – typically 15% to 25%, more in some areas
- Less chance for soil compaction
- Earlier spring warm up
- Longer & more predictable growing season
- Very slowly reduce high magnesium levels
- Speed all field operations from planting to harvest

Why Tile?

- Reduce stuck situations, breakdowns, and repair costs
- Plant earlier
- Fewer seed & seedling diseases
- Spray more timely
- Reduce surface water
- Lower high soil pH
- Reduce salt levels



What Do You Need to Install Tile?

- Tile plow – approx. $20,000 for a pull-type
- Guidance system (Intellislope or AGPS) – approx. $8000
- Stringer cart – approx. $5000
- 3 Tractors – one on the plow, one to pull (just in case), and one to lay out the tile with the stringer cart
- Backhoe – can be large or small
- RTK guidance, sub-inch accuracy is a must
- Tile & couplers – be sure to order semi-loads of tile in advance. Load programs in the summer and winter offer big discounts.
- Preferably 3 people

Tiling "Calendar" On Our Farm

- Tile in emerged corn – from when planting is completed until corn is 1 foot tall – May 20 – June 10 (3 weeks)
- Tile in emerged soybeans – from when corn is 1 foot tall until when soybeans are 1 foot tall – June 10 – June 30 (3 weeks)
- Tile in wheat stubble – from when wheat harvest is completed until soybean combining time – July 20 – Sept. 25 (9 weeks)
- Tile anywhere – after harvest until 1 foot of frost – Nov. 1 – Dec. 10 (5 weeks)

Tiling on YOUR Farm

1) Learn how tiling is great for the environment, your farm, and your community
2) Design your drainage system
3) Order tile well in advance
4) Get your ground ready for inspection
5) Get a Wetlands Determination from NRCS
6) Work together with your neighbors
7) Get highway department approval
8) Get your permits, probably from your county
9) Call One Call before you tile
10) Install tile yourself whenever possible
11) Be sure to regularly inspect & maintain your tile

Approx. Tile Cost

- 4" - $0.35 per foot
- 5" - $0.50
- 6" - $0.85
- 8" - $1.40
- 10" - $2.65
- 12" - $3.35

How Much Does Tile Cost Per Acre?

- It varies tremendously based on tile size, slope, spacing, and whether you do it yourself or not.
- For example, if you have 160 acres split into 4 sections done with 50' spacing, 0.15% grade, & 3/8" drainage coefficient, you'd have approx. 135,200 feet of 4" tile & 6500 feet of 10" tile. Tile cost would be approx. $64,545 or $403/acre.
- If 160 acres were split into 2 sections with 70' spacing, 0.65% grade, & 1/4" coefficient, you'd only need 96,200' of 4" & 3900' of 8" for a total tile cost of approx. $39,130 or $245/acre.

How Much Does Tile PAY Per Acre?

- If you gain 15% in yield to go from 150 bushel corn to 172.5 bushel corn, at $5 corn, that's a $112.50 per acre per year income increase.
- If you invested $500 per acre to achieve this, $112.50/$500 = 22.5% ROI.
- Plus, don't forget the value of your land has probably increased by $500/acre, too.
- Additionally, you'll be stuck less, done with planting & harvesting earlier, see less erosion, and you'll do a better job building your soil over time more quickly.

How Much Does Tile PAY Per Acre?

- If you gain 25% in yield to go from 150 bushel corn to 187.5 bushel corn, at $5 corn, that's a $187.50 per acre per year income increase.
- If you invested $500 per acre to achieve this, $187.50/$500 = 37.5% ROI.
- If you gain 25% in yield to go from 40 bushel soybeans to 50 bushel soybeans, at $13 beans, that's a $130 per acre per year income increase.

  If you invested $500 per acre to achieve this, $130/$500 = 26% ROI.

How Much Does Tile PAY Per Acre?

- If you gain 10% in yield to go from 180 bushel corn to 198 bushel corn, at $5 corn, that's a $90 per acre per year income increase.
- If you invested $100 per acre to achieve this, $90/$100 = 90% ROI.
- If you gain 10% in yield to go from 50 bushel soybeans to 55 bushel soybeans, at $13 beans, that's a $65 per acre per year income increase.
- If you invested $100 per acre to achieve this, $65/$100 = 65% ROI.

How to Determine Pipe Size

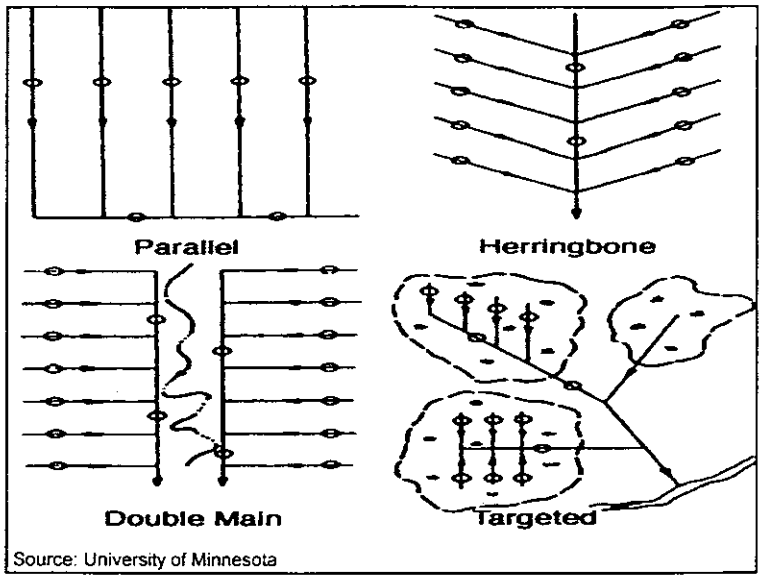
- 3 things: slope, pipe material, drainage coefficient
- Drainage coefficient "could" be less in SD or ND than MN
- Main & lateral sizes – examples with Prinsco card
- Increase the number of outlets to decrease your Main size

Drain inside Diameter (inches)	Drains not subjected to fine sand or silt (min velocity 0.5 ft/s)		Drains where fine sand or silt may enter (min velocity 1.4 ft/s)	
	Tile	*Tubing*	*Tile*	*Tubing*
3	0.08	0.10	0.60	0.81
4	0.05	0.07	0.41	0.55
5	0.04	0.05	0.30	0.41
6	0.03	0.04	0.24	0.32
8-12*		0.07		
12 and larger*		0.05		

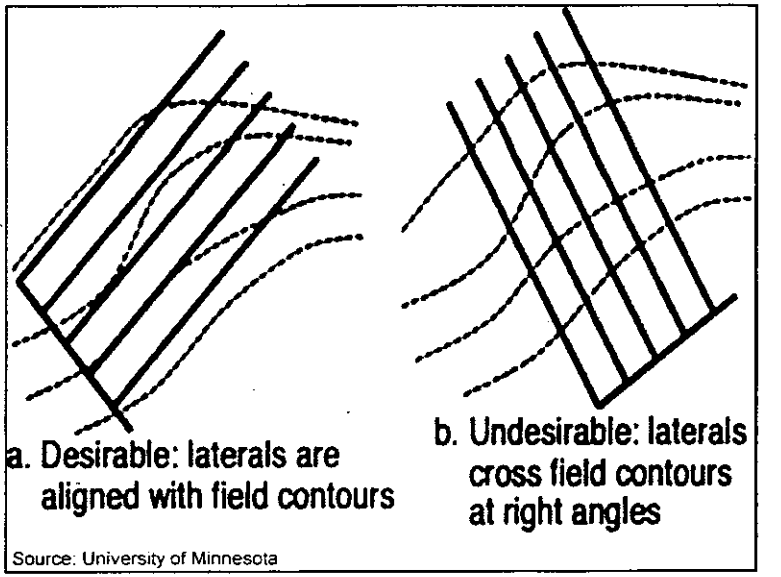
Source: University of Minnesota

How to Design a Drainage System

- As long as the water runs, most designs work
- Topography - map all your fields for elevation while planting using RTK
- Solve problem areas first – potholes especially
- 3 feet deep vs. 4 feet deep: 20% less total water removal and less flooding potential
- Min. depth: 2' for 6" & smaller, 2.5' for 8" or larger
- Keep main in lowest area
- Main should have the most grade, not the lateral
- We discourage the use of inlets



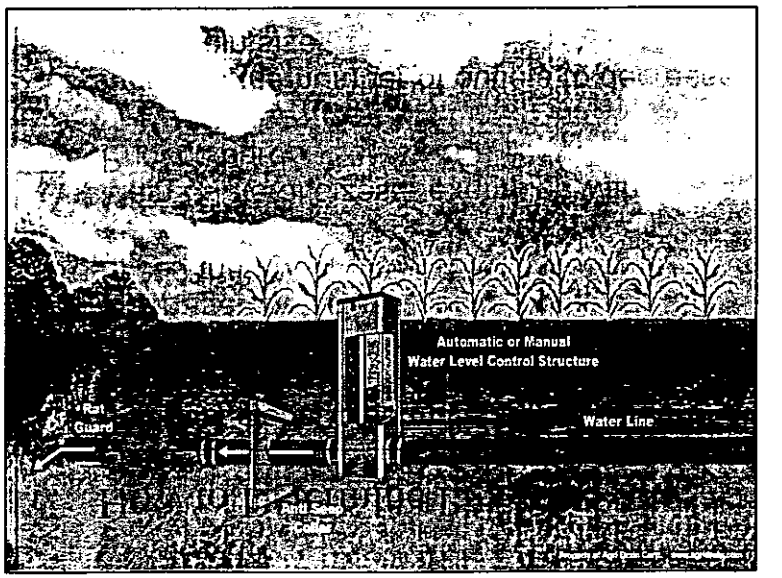
Source: University of Minnesota

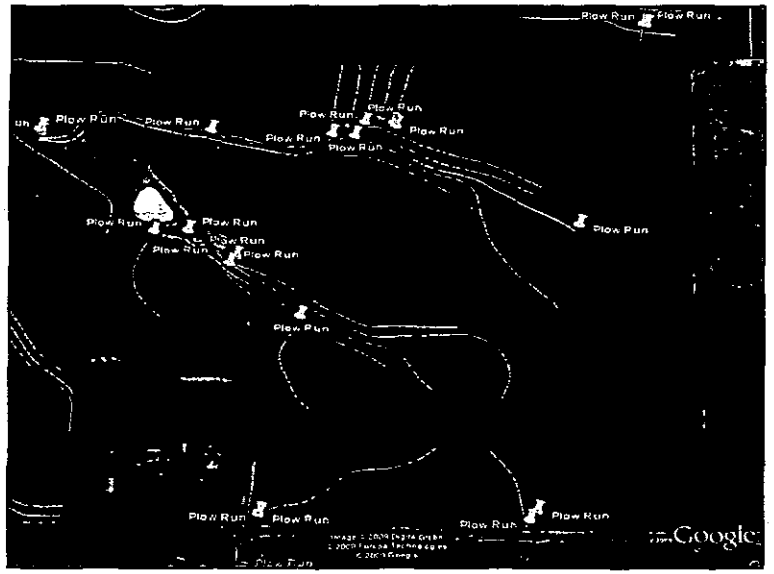


Source: University of Minnesota

Soil Type	Subsoil Permeability	Drain Spacing (ft) for: *Fair Drainage 1/4 in*	*Good Drainage 3/8 in*	*Excellent Drainage 1/2 in*	Drain Depth (ft)
Clay loam	Very low	70	50	35	3.0-3.5
Silty clay loam	Low	95	65	45	3.3-3.5
Silt loam	Moderately low	130	90	60	3.5-4.0
Loam	Moderate	200	140	95	3.8-4.3
Sandy Loam	Moderately High	300	210	150	4.0-4.5

Source: University of Minnesota





2010 North Dakota Prevented Plant Acreage

The average since 1995 has been just shy of 1.2 million acres annually according to ND FSA. This amounts to about 5% of North Dakota's crop acres each year.

Crop	Acres
Soybeans	265,979
Barley	72,612
Corn	402,834
Sugar Beets	209
Flax	33,876
Dry Peas	22,992
Potatoes	4,618
Wheat	480,305
Canola	79,833
Oats	6,060
Dry Beans	55,191
Safflower	1,398
Sunflowers	178,659
Mustard	521
Rye	43
TOTAL	**1,605,130**

4 Erosion & Water Quality

- Skaggs (1982) reported that improvement in subsurface drainage decreases excess surface water and erosion.
- Bottcher (1981) reported that a complete subsurface drainage system significantly reduced runoff and sediment losses
- Istok and Killing (1983) reported that runoff and sediment yield was reduced about 65% and 55%, respectively, due to installation of a drainage system.

Report Number: 08-202-2017
Date Reported: Jul 20, 2008
Date Received: Jul 14, 2008
Date Sampled: Jul 11, 2008

Midwest Laboratories®
WATER ANALYSIS

Reported to: HEFTY SEED COMPANY
MIKE DREY
47504 252ND ST
BALTIC SD 57003-

WATER ANALYSIS

Sample ID: HOME EAST
Lab Number: 1446679

Level Exceeds EPA Limits | Problems Likely | Potential Problems | No Apparent Problems | Non-Detect

Analyte	SODIUM Na ppm	CALCIUM Ca ppm	MAGNESIUM Mg ppm	pH	NITRATE NITROGEN NO3-N ppm	SULFATE SO4 ppm	CONDUCTIVITY mmhos/cm	TOTAL DISSOLVED SOLIDS (TDS) ppm	SAR	PHOSPHORUS P ppm	POTASSIUM K ppm	BICARBONATE HCO3 ppm	CHLORIDE Cl ppm	BORON B ppm
Level Found	29.5	107	51.0	8.38	8.6	36	0.972	632	0.60	n.d.	1.2	453	17	0.07
Caution Level	300	150	80	9	60	450	3	2000	4	1	40	400	200	0.8

Laboratory Sample ID	Analysis	Level Found	Units	Detection Limit	Method	Analyst	Date
1446679 HOME EAST	Iron (total)	0.53	mg/L	0.01	EPA 200.7	klh	07/17/08
	Manganese (total)	0.15	mg/L	0.01	EPA 200.7	klh	07/17/08
	Copper (total)	n.d.	mg/L	0.01	EPA 200.7	klh	07/17/08
	Zinc (total)	0.02	mg/L	0.01	EPA 200.7	klh	07/17/08
	Carbonate as CaCO3	10.2	mg/L	0.01	EPA 310.1	jdb5	07/16/08

Nitrogen Management & Tiling

- Nitrates can leach easily in soil...why?
- What is YOUR C.E.C. and how does that affect nitrogen holding capacity?
- Methods to reduce nitrogen leaching:
  - Do NOT overapply N in any form, including manure. Be realistic with yield goals.
  - Split-apply – little in fall, more at planting, the rest at sidedress
  - Nitrogen stabilizers like Nutrisphere-N & Instinct keep N in ammonium form longer, which is good for plants and reducing leaching

Nitrogen Management & Tiling

- Methods to reduce nitrates going from your tile line to the river:
  - Have your outlet at a grass waterway. If the water is able to run over the grass, it will reduce the nitrate level.
  - Use a bioreactor like wood chips at the outlet.
  - Use a Drainage Water Management system to close down your outlets at certain times of year.
  - If you have a lift station you can shut the pumps off at certain times of year.
  - Outlet into a wetland so there is an additional stop before water goes further downstream.

4 Erosion & Water Quality

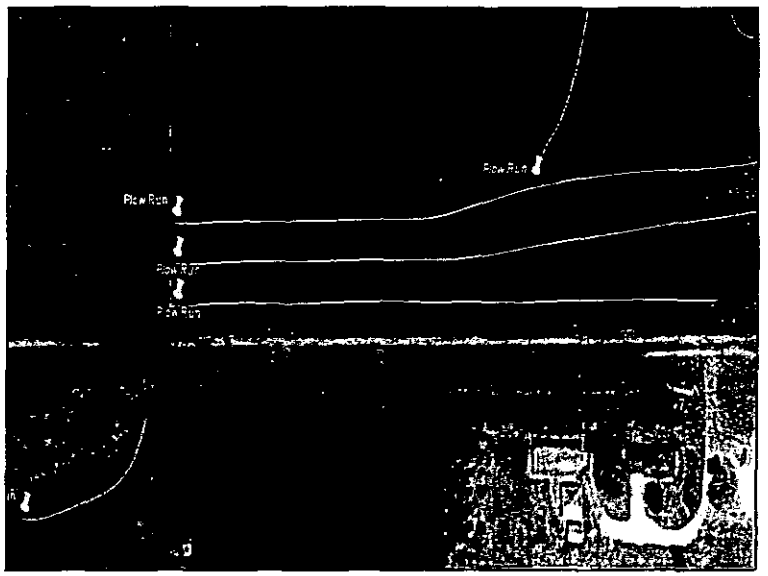
- Tiling reduces erosion
- Tiling reduces sediment in water
- Tiling reduces most fertilizer and chemical contaminants
- Tiling could possibly increase nitrate levels in water, but rarely would that mean the water would exceed 10 ppm of nitrate, especially if farmers use good nitrogen management practices.

5 Flooding Impact on Communities

- By tiling, peak waterflow will be reduced.
- Zucker and Brown, Ohio State University (1998) concluded that subsurface drainage (tiling) reduces peak flows from watersheds by 15 to 30 percent, and has little impact on the total annual flow from watersheds.
- When tile removes excess water throughout the year, soil is able to absorb more water when rainfall or snowmelt occurs so flooding is reduced.

6 Flooding Impact on Roads

- In North Dakota, road conditions and maintenance are a perennial issue.
- Many roads across the state have been damaged from underground by seeping water. Water is the number one enemy to roads.
- If tile and other drainage work is done correctly, water will be funneled to the right areas, leading to better roads.



7 County Drainage Ordinances

Barnes	John Froelich (701) 845-1371	Valley City	N/A	$0	Downstream is determined by Corps of Engineers.
Cass	Kimberly Bomstad (701) 298-2381	West Fargo	N/A	$500	Downstream is case by case based on what tributary you're looking to dump in.
Dickey	Don Zimbleman (701) 375-6378	Ellendale	1.5 Miles	$75	Fill out drainage permit with water board to begin process.
Grand Forks	Pam Aaker (701) 780-8312	Grand Forks	N/A	N/A	County engineer will determine downstream. Fill out permit to be sent to state for review. No cost.
Lamoure	Darrin Hirschkorn (701)-883-5344	Lamoure	N/A	N/A	Nothing set in place at this time.
Pembina	Gary Nilsson (701) 549-3443	Cavalier	N/A	N/A	Downstream and Permit cost depend on township.
Ransom	Gaylon Dick (701) 683-4133	Lisbon	N/A	$0	Must get permission from every neighbor until discharge.
Richland	Monica Zentgraf (701) 642-7773	Wahpeton	1 Mile	$0	State application form to be filled out to begin the process at the water resource district.
Sargent	Sherry Hosford (701) 724-6241	Forman			
Steele	Jill Borth (701) 524-1105	Finley	1 Mile	$500	80+ acres must be approved by the state.
Traill	Gary Thompson (701) 636-5812	Hillsboro	1 Mile	$500	80+ acres must be approved by the state
Walsh	Larry Tanke (701) 352-0081	Grafton	1 Mile	$100	

Drainage Laws

- North Dakota
- South Dakota
- Minnesota
- Iowa

8 NRCS Wetland Determinations

- For farmers who wish to remain in the USDA Farm Program, NRCS must inspect their land first to do a "Wetlands Determination". Unfortunately, farmers believe the process to be too subjective and too time-consuming, often taking 1 to 2 years to do a simple site inspection and evaluation.

NRCS

- Why was NRCS originally created?
- The following principles are NRCS's heritage and still guide its work:
- Assess the resources on the land, the conservation problems and opportunities.
- Draw on various sciences and disciplines and integrate all their contributions into a plan for the whole property.
- Through implementing conservation on individual properties, contribute to the overall quality of the life in the watershed or region.
- Work closely with land users so that the plans for conservation mesh with **their (farmer's) objectives**.

9 U.S. Fish & Wildlife Easements

- U.S. Fish & Wildlife has perpetual wetlands easements on some farms. Many of these have been in effect for 40+ years (the program started in 1958), and through several landowners. There is currently no way to "buy out" of the easement.
- The easements are considered "negative" easements, because unlike most easements that allow landowners to continue to use the ground as they wish, these easements PREVENT the landowner from draining, leveling, most mining, and many other things.

9 U.S. Fish & Wildlife Easements

- What I don't understand is how, according to North Dakota state law, perpetual easements are prohibited, yet these easements seem to be enforceable.
- According to U.S. Fish & Wildlife, there are now more than 1.2 million acres enrolled in this program in the Dakotas and Montana.
- North Dakota has by far the largest share of these acres (it was over 750,000 acres by 1981), and from what I could find, it appears these easements were purchased for approx. $40 per ac. on avg.

10 Lack of Understanding

- Currently, there is a lack of understanding about water management, tiling, and drainage in the government, the general public, the farm community, farm neighbors, and landowners.
- Most people believe that "drainage" is a bad thing in many cases, but when it is done correctly it is beneficial to everyone, including the soil and soil life.

Key Points to Stress To Non-Farmers

- Tiling Reduces Erosion – proven by universities
- Tiling Reduces Flooding – lowers water tables so soil can absorb more rainfall
- Tiling Improves Downstream Water Quality – phosphorus & turbidity are dramatically reduced, nitrates could increase slightly but usually don't increase appreciably if proper nitrogen management techniques are used by farmers
- Farmers are NOT removing wetlands designated by NRCS. Farmers are tiling FARM GROUND!
- Tiling improves roads – redirects flow

Key Points to Stress To Non-Farmers

- New Tiling Methods:
  - No intakes – keeps water clean, reduces flooding
  - Shallow installation – installing tile at 3' vs. 4 to 6 feet dramatically reduces water removed from soil & means lines are frozen and NOT running in spring
  - GPS guidance – means coordinates are available for all tile lines, installation is done more precisely, accurately, and less expensively
- Tiling improves income for local communities and helps provide more food for our growing world

Key Points to Stress To Non-Farmers

- Tiling helps farmers maximize production on current farmland, meaning non-cropland can be kept for other uses such as hunting and recreation
- Keep in mind that about 1/3 of the world's population is under-fed, and another 1/3 is starving. There are an estimated 160 million children under the age of 5 who are malnourished, according to the U.N. The world needs more food. Tiling can help.

What Does Stewardship Mean?

- According to Webster, stewardship = the careful and responsible management of something entrusted to one's care
- "Conservation means development as much as it does protection." Theodore Roosevelt

What Does Stewardship Mean?

- *Leviticus 25:23-24.* The land is mine (God's) and you are but aliens and my tenants. Throughout the country that you hold as a possession, you must provide for the redemption of the land.

Summary

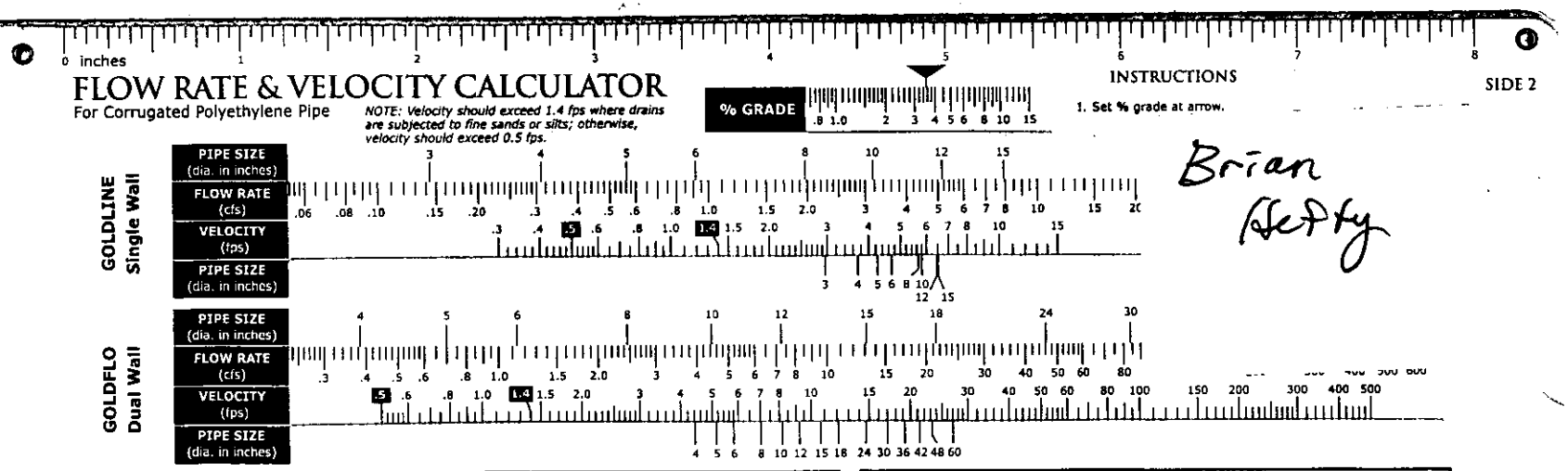
- In my opinion, there are at least 5 million crop acres in North Dakota that are poorly drained today, costing the state about $1 billion annually.
- 5 million acres is just under 25% of crop acreage and just over 10% of the total area of the state.
- If 5 million acres were tiled for a cost of $400 per acre, that would be $2 billion, and farmers would be willing to pay for that.
- The result would be better crops, lower insurance costs, more income for the state, better roads, reduced erosion, better water quality, and reduced flooding problems.

CONTACT INFO FOR BRIAN:

Brian Hefty:

Office: 605-529-5412

E-mail: brian@agphd.com



FLOW RATE & VELOCITY CALCULATOR

For Corrugated Polyethylene Pipe

NOTE: Velocity should exceed 1.4 fps where drains are subjected to fine sands or silts; otherwise, velocity should exceed 0.5 fps.

% GRADE

INSTRUCTIONS

1. Set % grade at arrow.

SIDE 2

GOLDLINE Single Wall

PIPE SIZE (dia. in inches)
FLOW RATE (cfs)
VELOCITY (fps)
PIPE SIZE (dia. in inches)

GOLDFLO Dual Wall

PIPE SIZE (dia. in inches)
FLOW RATE (cfs)
VELOCITY (fps)
PIPE SIZE (dia. in inches)

Brian Hefty

APPROXIMATE PIPE REQUIREMENTS

SPACING	ft/ac	SPACING	ft/ac
20	2180	110	395
30	1450	120	360
40	1089	130	335
50	870	140	310
60	725	150	290
70	620	160	270
80	545	180	240
90	485	200	220
100	435	250	175

0.8 % GRADE

Length of run in feet		FEET OF FALL		Length of run in feet
	200 1.6		9.6 1200	
	400 3.2		11 1400	
	600 4.8		13 1600	
	800 6.4		14 1800	
	1000 8.0		16 2000	

Set % grade in top window. Read feet of fall at length of run.

MINIMUM RECOMMENDED GRADES (PERCENT) FOR DRAINAGE PIPES

Drain Inside Dia.	Drains not subjected to fine sand or silt (min. velocity 0.5 fps)		Drains where fine sand or silt may enter (min. velocity 1.4 fps)	
	Concrete	Plastic	Concrete	Plastic
3"	0.08	0.10	0.60	0.81
4"	0.05	0.07	0.41	0.55
5"	0.04	0.05	0.30	0.41
6"	0.03	0.04	0.24	0.32
8-12"		0.07		
12" +		0.05		

Available upon request

WATER MANAGEMENT SOLUTIONS

PRINSCO
ENGINEERED WITH INTEGRITY™

800.992.1725

WWW.PRINSCO.COM

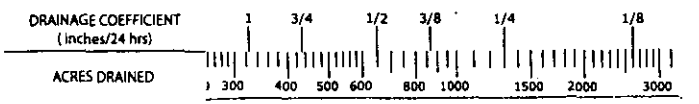
UNIVERSITY OF MINNESOTA
EXTENSION

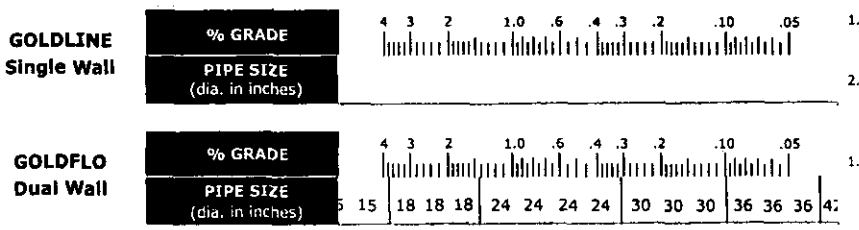
Item #07688. Produced in cooperation with the University of Minnesota Extension Service (800) 876-8636. Look for more educational information at www.extension.umn.edu

PIPE SIZE & ACRES DRAINED CALCULATOR

For Corrugated Polyethylene Pipe

SIDE 1





INSTRUCTIONS

1. Set acres to be drained at drainage coefficient in window above.
2. Read required pipe diameter based on type of pipe at % grade.

OR

1. Set pipe size at % grade and read acres drained at drainage coefficient.

PIPE COIL LENGTHS

PIPE SIZE (DIA. IN INCHES)

NUMBER OF WRAPS	4	5	6	8	10	12
1	135	100	90	90	80	90
2	290	250	220	230	200	195
3	485	440	390	390	350	320
4	720	670	590	590	525	
5	995	940	830	825		
6	1310	1250	1110			
7	1665	1600	1450			
8	2060	1980				
9	2500	2300				
10	3000					

GENERAL DRAINAGE COEFFICIENTS (INCHES/24 HOURS)

	Soil Type	Field Crops	Truck Crops
without surface inlets	Mineral	3/8 to 1/2	1/2 to 3/4
	Organic	1/2 to 3/4	3/4 to 1-1/2

		Field Crops		Truck Crops	
	Soil Type	Blind Inlets	Open Inlets	Blind Inlets	Open Inlets
with surface inlets	Mineral	3/8 to 3/4	1/2 to 1	1/2 to 1	1 to 1-1/2
	Organic	1/2 to 1	3/4 to 1-1/2	3/4 to 2	2 to 4

© 2009 American Slide-Chart / Perrygraf, Wheaton, IL 60187 Printed in USA 19534 www.americanperrygraf.com

Available upon request

#2

North Dakota Grain Growers Association

Your voice for wheat and barley. www.ndgga.com

North Dakota Grain Growers Association
Testimony on HB 1459
February 10, 2011

- Brad Thykeson, Vice-President North Dakota Grain Growers. I farm in east central ND in the counties of Steele and Barnes. I farm with my two sons, ages 26 and 22. We raise soybeans, corn, and wheat. I have farmed since 1983, at that time I was in a partnership with my father--he retired in 2001 but is very active on the farm.

- In spring of 2009 we purchased a Wayne's tile plow. With many acres that have excess moisture problems, we felt that purchasing our own tile plow was a good investment. Going to many seminars put on by NDSU and private parties (Hefty Bros.) and even the ND Water Resource Council, we felt informed enough to do the tiling ourselves.

- We applied for a water permit from the Steele County Water District and informed the NRCS about our intentions. The Water District charged $500 for the permitting process and sent the application off to the state for approval. This was very simple and trouble free to achieve.

- The NRCS has been a learning experience that is frustrating and very hard to achieve the correct procedures without feeling that we are in the wrong. I know that NRCS is out of the state hands but a resolution stating the local (county)

NRCS office should be an information source and not a regulatory agency would go a long way to promote tiling in North Dakota.

- I would strong urge that this committee and you as representatives do all that you can to help this bill pass to make a tile process as simple and friendly as it can be. Controlling our excess moisture helps the state in more ways than we can name. I strongly encourage a due pass vote on this bill.

#3

TESTIMONY ON HOUSE BILL 1459

House Agriculture Committee

John Paczkowski, Chief
Regulatory Section
Office of the State Engineer

February 10, 2011

Chairman Johnson and members of the House Agriculture Committee, my name is John Paczkowski and I am Chief of the Regulatory Section of the Office of the State Engineer (OSE). On behalf of the State Engineer, Todd Sando, I am testifying in support of the primary intent of House Bill 1459. First let me say that the intent of HB 1459 and the other bills attempting to streamline the process for obtaining a permit for tile drainage, and the critical problems of high water tables and soil salinization that have motivated them are clearly understood by the OSE. We believe that the objective of this initiative is to establish a procedure for permitting tile drains that assures a coherent and effective regulatory process, which includes due diligence while avoiding unnecessary loss of time. The OSE is willing to assist in fulfilling this intent.

It is our understanding that House Bill 1459 and Senate Bill 2280 are being amended and consolidated, therefore, addressing the specific language of HB 1459 as it currently stands would likely be counter-productive. The State Engineer and his staff have reviewed the proposed amendments and believe that the amendments, as presented, can provide a reasonable foundation for establishing a coherent regulatory process for permitting tile drainage. Some further adjustment and working through of details will likely be necessary. We believe that an interim study resolution would be very helpful to identify and work through these issues.

In conclusion, the OSE is willing to assist in any way it can to achieve a coherent, effective, and streamlined process for permitting tile drainage.

I would be happy to answer any questions you might have.

HB 1458

NDLA, H AGR

From: Michael Schnell [mschnell@ellingsondrainage.com]
Sent: Thursday, February 10, 2011 5:56 PM
To: NDLA, H AGR
Subject: Michael Schnell - Ellingson Companies Testimony

#4a

Thanks for everything.

Attached you will find my testimony. I also referred everyone to my two handouts, which included the drainage book and the Red River Valley Joint Water Resource District resolution.

Thanks again!

Mike

--

Chairman Johnson, members of the committee, my name is Michael Schnell. I am a native of Minot, ND, graduated from North Dakota State University in 2001 and manage Marketing & Government Affairs for Ellingson Companies. Thank you for allowing me the opportunity to testify today.

Creating an application form that is specific to subsurface drainage is a significant improvement. The application form, and law, that are currently used to regulate subsurface drainage were designed for surface drainage and are being interpreted to try to meet the needs of a much different process. The creation of an application form that was specifically designed for subsurface drainage is a major step forward in this process.

Secondly, HB 1459 works to remove delays caused by the State permitting process while leaving the protections rightly afforded to downstream landowners and the people of the State of North Dakota 100% unchanged. To obtain a permit presently, you must submit a permit to your local water board, and the State Engineer. The State permit takes anywhere from one month to more than three months to be approved and it creates a drain on the resources of the State Engineering office and is an unnecessary delay built into the system. I have included a 2009 resolution from the Red River Joint Water Resource District where that group, which is encompassed of members from all of the local Water Resource Districts in the Red River Valley, asks for the local water boards to have sole decision-making authority on tile drainage projects.

We support the resolution passed by the Red River Joint Water Resource District and believe that when HB 1459 is approved, and signed into law, the delays that are built into the current system will be removed.

In the end, HB 1459 isn't really about water. It is about something that North Dakota has become known for, **GOOD GOVERNMENT**. When properly installed, subsurface drainage will increase yields and land value, increase the water storage capacity of the land where it is installed, significantly decrease surface runoff and peak flow of water and as was pointed out by the Red River Joint Water Resource District, can provide summer flood mitigation benefits. This means that subsurface drainage is cleaner and more effective than surface drainage and increases tax revenues for local and state governments without causing harm to downstream landowners.

We strongly encourage the committee work to move the State of North Dakota forward with passage of HB 1459.

[redacted]hael S. Schnell
Marketing & Government Affairs
Ellingson COMPANIES
P: 888.527.2294 | F: 507.527.2296
mschnell@ellingsondrainage.com
www.EllingsonCompanies.com

Michael Schnell

HB 1458 #46

RED RIVER JOINT WATER RESOURCE DISTRICT
RESOLUTION OF SUPPORT REGARDING AGRICULTURAL TILE DRAINAGE

WHEREAS, The Red River Joint Water Resource District is a Joint Water Resource District organized under N.D. Cent. Code Chapter 61-16.1-11.

WHEREAS, the Red River Joint Water Resource District's members are Water Resource Districts in the Red River Valley with those powers enumerated in Title 61 of the North Dakota Century Code, including the power and authority to approve and deny drainage permit applications in accordance with Chapter 61-32 of the North Dakota Century Code.

WHEREAS, drainage permit applications that are not "of statewide or interdistrict significance" require Water Resource Districts to conduct certain investigations and reviews before Boards can enter final decisions regarding permit applications, including land ownership, watershed impacted, impacts to downstream landowners, and other items, all in accordance with Chapter 89-02-01 of the North Dakota Administrative Code.

WHEREAS, the North Dakota State Engineer's Office has authority under N.D.A.C. § 89-02-01-08 to process drainage applications, and to forward applications along with any recommendations, comments, or directives to the individual Water Resource Districts responsible for entering final decisions regarding individual drainage permits.

WHEREAS, the North Dakota State Engineer's Office has authority under N.D.A.C. § 89-02-01-09.11 to attach conditions to drainage applications prior to forwarding the applications to the individual Water Resource Districts responsible for entering final decisions regarding individual drainage permits.

WHEREAS, in recent years, the volume of tile drainage permit applications has increased substantially, and the North Dakota State Engineer's Office has imposed enhanced investigative requirements upon Water Resource Districts in response to the issues unique to tile drainage projects.

WHEREAS, in recent years, the volume of tile drainage permit applications has increased substantially, and the North Dakota State Engineer's Office has increasingly attached numerous conditions to tile drainage applications.

WHEREAS, the Red River Joint Water Resource District views the conditions attached to tile drainage applications by the North Dakota State Engineer's office as unnecessary constraints that often limit and interfere with the determinations of local Water Resource Districts which have greater knowledge of the subject watersheds, and better understanding of the impacts of local tile drainage projects.

WHEREAS, due to many of the questionable conditions attached to tile drainage permits by the North Dakota State Engineer's office, the Red River Joint Water Resource District believes local Water Resource Districts should have sole decision-making authority regarding tile drainage impacts and the necessity for downstream flowage easements regarding tile drainage projects.

WHEREAS, soils in the Red River Valley are conducive to subsurface tile drainage, and properly designed and constructed tile drainage projects can remove excess sheetwater to maximize crop yields and land values.

Ohnstad Twichell
attorneys

WHEREAS, the Red River Joint Water Resource District views agricultural tile drainage as a favorable means of managing sheetwater and wishes to voice its support for agricultural tile drainage in the Red River Valley, and its opposition to excessive administrative burdens in the tile drainage permitting process created by the North Dakota State Engineer's Office.

NOW THEREFORE, BE IT RESOLVED that the terms contained in this RESOLUTION represent the Red River Joint Water Resource District's official position regarding agricultural tile drainage.

BE IT FURTHER RESOLVED that the Red River Joint Water Resource District believes that, generally, tile drainage removes excess water from surface soils, and increases the absorptive properties of surface soils as compared to similarly situated untiled soils.

BE IT FURTHER RESOLVED that the Red River Joint Water Resource District believes that, generally, tile drainage improves the absorptive properties of surface soils and therefore increases the potential for rainwater to infiltrate into the ground.

BE IT FURTHER RESOLVED that the Red River Joint Water Resource District believes that, generally, tile drainage increases the infiltration potential of surface soils and that, as a result, tile drainage may reduce and delay the rate of sheetwater surface runoff compared to similarly situated untiled soils.

BE IT FURTHER RESOLVED that the Red River Joint Water Resource District believes that, generally, tile drainage may reduce and delay the peak runoff rate for typical rainstorms and sheetwater, and therefore supports tile drainage as a means of reducing the frequency and severity of summer flooding.

BE IT FURTHER RESOLVED that the Red River Joint Water Resource District generally supports and encourages the installation of agricultural tile drainage in the Red River Valley Watershed as a means of providing summer flood mitigation benefits.

BE IT FURTHER RESOLVED that the Red River Joint Water Resource District supports and encourages landowners to construct agricultural tile drainage projects in accordance with their legal obligations under Chapter 61-32 of the North Dakota Century Code.

APPROVED:

_____
James Lyons, Chair

ATTEST:

_____
Joan Svaleson
Secretary-Treasurer

Date Approved: _____, 2009

Olinstad Mitchell attorneys

Available upon request

641

U. S. DEPARTMENT OF AGRICULTURE.

FARMERS' BULLETIN No. 187.

Drainage of Farm Lands.

BY

C. G. ELLIOTT,

DRAINAGE EXPERT, IRRIGATION INVESTIGATIONS,
OFFICE OF EXPERIMENT STATIONS.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1904.

Written Testimony - 3/18/11 Unattended meeting

Chairman Flakoll, members of the committee, my name is Michael Schnell. I am a native of Minot, ND, graduated from North Dakota State University in 2001 and manage Marketing & Government Affairs for Ellingson Companies. Thank you for allowing me the opportunity to testify today.

In North Dakota the current permitting process for subsurface drainage leads to a lot of fighting, and much of that will be solved by the improvements made to the law through passage of House Bill 1459.

First, creating an application form that is specific to subsurface drainage is a significant improvement. The application form, and law, that are currently used to regulate subsurface drainage were designed for surface drainage and are being interpreted to try to meet the needs of a much different process. The creation of an application form that was specifically designed for subsurface drainage is a major step forward..

Secondly, HB 1459 works to remove delays caused by the State permitting process while leaving the protections rightly afforded to downstream landowners and the people of the State of North Dakota 100% unchanged. To obtain a permit presently, you must submit a permit to your local water board, and the State Engineer. The State permit takes anywhere from one month to more than three months to be approved and creates a drain on the resources of the State Engineering office building an unnecessary delay into the system. I have included a 2009 resolution from the Red River Joint Water Resource District where that group, which is encompassed of members from all of the local Water Resource Districts in the Red River Valley, asks for the local water boards to have sole decision-making authority on tile drainage projects.

We support the resolution passed by the Red River Joint Water Resource District and believe that when HB 1459 is approved, and signed into law, the delays that are built into the current system will be removed.

In the end, HB 1459 isn't really about water. It is about something that North Dakota has become known for, **GOOD GOVERNMENT**. When properly installed, subsurface drainage will increase yields and land value, increase the water storage capacity of the land where it is installed, significantly decrease surface runoff and peak flow of water and as was pointed out by the Red River Joint Water Resource District, can provide summer flood mitigation benefits. This means that subsurface drainage is cleaner and more effective than surface drainage and increases tax revenues for local and state governments without causing harm to downstream landowners.

We strongly encourage the committee work to move the State of North Dakota forward with passage of HB 1459.

North Dakota
Grain Growers Association

Your voice for wheat and barley. www.ndgga.com

#1

North Dakota Grain Growers Association
Testimony on HB 1459
March 18, 2011

- Brad Thykeson, Vice-President North Dakota Grain Growers. I farm in east central ND in the counties of Steele and Barnes. I farm with my two sons, ages 26 and 22. We raise soybeans, corn, and wheat. I have farmed since 1983, at that time I was in a partnership with my father--he retired in 2001 but is very active on the farm.

- In spring of 2009 we purchased a Wayne's tile plow. With many acres that have excess moisture problems, we felt that purchasing our own tile plow was a good investment. Going to many seminars put on by NDSU and private parties (Hefty Bros.) and even the ND Water Resource Council, we felt informed enough to do the tiling ourselves.

- We applied for a water permit from the Steele County Water District and informed the NRCS about our intentions. The Water District charged $500 for the permitting process and sent the application off to the state for approval. This was very simple and trouble free to achieve.

- The NRCS has been a learning experience that is frustrating and very hard to achieve the correct procedures without feeling that we are in the wrong. I know that NRCS is out of the state hands but a resolution stating the local (county)

NRCS office should be an information source and not a regulatory agency would go a long way to promote tiling in North Dakota.

- I would strong urge that this committee and you as representatives do all that you can to help this bill pass to make a tile process as simple and friendly as it can be. Controlling our excess moisture helps the state in more ways than we can name. I strongly encourage a due pass vote on this bill.

#2

TESTIMONY ON ENGROSSED HOUSE BILL 1459

Senate Agriculture Committee

John Paczkowski, Chief
Regulatory Section
Office of the State Engineer

March 18, 2011

Chairman Flakoll and members of the Senate Agriculture Committee, my name is John Paczkowski and I am Chief of the Regulatory Section of the Office of the State Engineer (OSE). I am here testifying on behalf of the State Engineer in support of the primary intent of Engrossed House Bill 1459. First let me say that the intent of Engrossed House Bill 1459 and the other bills attempting to streamline the process for obtaining a permit for tile drainage, and the critical problems of high water tables and soil salinization that have motivated them are clearly understood by the State Engineer and his staff.

Engrossed House Bill 1459 provides a reasonable foundation for establishing a coherent regulatory process for permitting tile drainage, but we do have some concerns:

- Existing administrative rules allow the State Engineer the latitude to consider any drainage to be of statewide significance for good cause. One example of this is that since 1995 the State Engineer has determined that all drainage in the Devils Lake Basin is of statewide significance due to the ongoing flooding situation within the basin. As Engrossed House Bill 1459 is currently worded, the State Engineer would no longer be able to make such a determination within the Devils Lake Basin or any other area where a large-scale concern may arise.

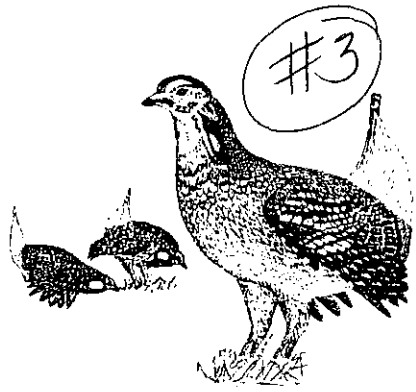
- The bill calls for the State Engineer to make a determination on the issuance of a permit application within 30 days for any application determined by the water resource district (district) to be of statewide significance. The process as outlined in N.D. Admin. Code ch. 89-02-01, the chapter dealing with drainage, does not lend itself to meeting the 30-day timeline. In order to meet the deadline a new set of administrative rules would need to be developed and approved. N.D.C.C. § 28-32-07 sets a nine-month deadline for rules to implement statutory change, which could leave an application found to be of statewide significance in limbo until the rules process was completed.

- The one-mile limit for "damage to others" prevents the district from dealing with potential serious problems beyond that mile. Of greatest concern is a terminal wetland beyond the one-mile limit. If a drainageway terminates on the land of another, say a mile and a half from the draining party, the district would not be authorized to protect that landowner through requiring

North Dakota Chapter

THE WILDLIFE SOCIETY

P.O. BOX 1442 • BISMARCK, ND 58502



TESTIMONY OF MIKE McENROE
NORTH DAKOTA CHAPTER OF THE WILDLIFE SOCIETY
ON HB 1459
SENATE AGRICULTURE COMMITTEE
MARCH 18, 2011

Chairman Flakoll and members of the Senate Agriculture Committee:

My name is Mike McEnroe and I represent the North Dakota Chapter of The Wildlife Society. The Chapter is a professional organization made up of over 320 biologists, land managers, university educators, and law enforcement officers in the wildlife and natural resource field.

The Chapter supports legislation which would regulate the subsurface drainage or pattern tile drainage systems, and require a permit from the State of North Dakota for the installation of an artificial subsurface drainage system.

The scientific literature on tile drainage is extensive, often contradictory in conclusions, and to date very little has been done in North Dakota. In other words, one can find a study from somewhere that claims benefits or impacts for almost every aspect of tile drainage. Each tile drainage proposal has a unique set of circumstances; soil types, slope and topography, climate and weather, cropping history, existing surface drainage, and receiving streams. Sorting it all out and predicting either the beneficial or detrimental outcome of a proposed project takes a lot of technical expertise.

For that reason, the Chapter opposes HB 1459, which proposes that the County Water Resource Districts approve the tile drainage permit process. We suggest that the State Water Commission and the State Health Department jointly review and approve permits for tile drainage. These agencies have the science-based staff to conduct the necessary analyses of water quality and quantity impacts to determine permit approval or denial for tile drainage projects. It may also be advisable to have the State Agriculture Department play a role in project review.

Generally the scientific literature would support that tile drainage will increase yield or productivity of at least some crops, would remove water from saturated or water-logged soils, and would result in a desalinization of soils. Tile drainage seems

to yield less phosphorous, pesticide residue, and sediment when compared to lands without tile drainage systems. This is largely because phosphorus and pesticides are tied to soil particles or sediment, and soil movement is less likely to occur through subsurface drains.

On the other hand, tile drainage generally increases levels of nitrates (usually in concentrations greater than 10 mg/l), salts, and trace metals in the effluent and downstream receiving waters. Nitrate levels over 10 mg/l cause drinking water problems, blue baby syndrome, and are difficult or expensive to remove from municipal drinking water supplies. Studies are being conducted in six counties in eastern North Dakota by NDSU Extension and the State Health Department. Preliminary results are similar to these other studies.

Increases in water flows in receiving streams are a mixed bag. Tile drains in the north typically flow during April through June. From July through October, crop production removes most soil water through evapo-transpiration. During November through March, drains operate very seldom because the soil and the moisture above the tile are frozen. However, in some years, it is possible for drain tiles to operate throughout the winter months if the soil is insulated by heavy snow cover.

Also, in North Dakota where subsurface drainage is being proposed, ie., the Red River Valley, there already is an extensive system of surface drainage. The tile drainage will be additive to the existing surface drainage. Research shows, that when combined with surface drainage, the addition of subsurface tile drainage will increase the total annual water output from the drained lands.

Given the eutrophic nature of Devils Lake and Lake Ashtabula, and the dependence of cities on the Red River for drinking water, it makes little sense to add more nitrates to these waters. Given the flood situation at Devils Lake and along the Red River, it also makes no sense to artificially add any water to these basins.

We would recommend that any subsurface or surface drainage project proposed in the eastern seventeen counties of North Dakota be declared of "statewide significance."

An individual tile drainage project would likely have minimal or negligible impacts on downstream residents or landowners. However, as more and more tile drainage systems are installed, there are likely to be downstream cumulative impacts to landowners and municipalities. The combined state agencies have the expertise to analyze the impacts of proposed tile drain projects; the County Water Resource Districts do not.

Analysis of the efficacy and impacts of proposed tile drain projects will take time. A thirty-day time frame is not sufficient to consider the data and the downstream impacts. In addition, notification of downstream interests should not be restricted

to those located within 1 mile of the proposed project. Notification should be required for all downstream interests that will be affected as the effluent moves downstream.

For all these reasons, we would urge a "do not pass" vote on SB 1459.

Thank you for the opportunity to comment on this bill. I would try to answer any questions the committee may have.

Attachments:

State Water Commission article, "Tile Drainage Gaining Popularity in State in Recent Years", ND Water Magazine, July 2006.

Cover of State Water Commission report, Response to SB 2020, section 11 of the 60th Legislative Assembly of North Dakota, 95 page report.

Email letter to Editor on Fargo Forum Inforum, March 5, 2011.

Tile Drainage Gaining Popularity in State in Recent Years

By Michael Noone

In North Dakota, where large portions of the state have been in a wet cycle for over a decade, agricultural land has been frequently inundated with standing water, either from snowmelt, or from frequent storms. Standing water on land delays planting, and can kill crops that have been planted.

Unfortunately, areas throughout North Dakota that have been wet are also areas with clay-rich soils that have poor water infiltration, leading to standing water for prolonged periods of time. It is understandable that farmers want to get standing water off of their land as soon as possible, to improve their chances of higher yields in the fall.

A practice that has gained popularity in North Dakota in recent years is called tile drainage. Perforated polyethylene tubing is buried in a field, generally at a depth of three to six feet.The pipe takes in surrounding ground water that is saturating the soils, and transports it away from the field. From there, the water is discharged into a waterbody such as a large wetland or lake, ditch, or into a natural watercourse.

Tile drainage can help a landowner farm land that might otherwise be lost to flooding for that season. It is called "tile" drainage because up until the 1970s, most drainpipes were made from short, cylindrical sections of concrete or clay called "tile."

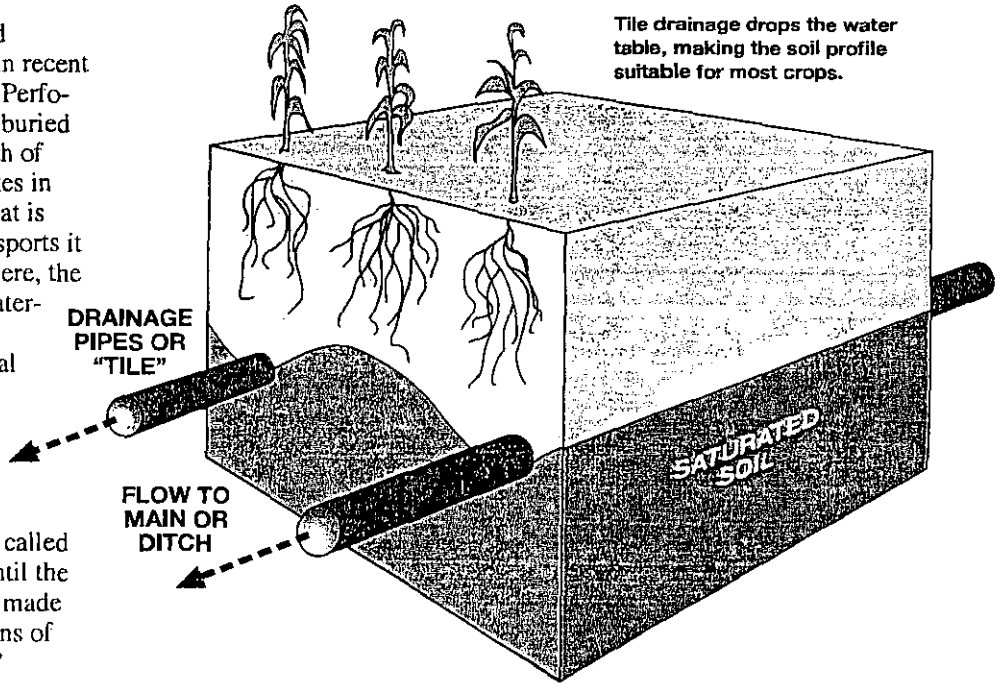
The positive aspect of using tile drainage in agriculture is that it allows for timely fieldwork and crop growth on soils that would otherwise be marginal for agriculture. The downside of this practice is the potential for increased flooding downstream, negative effects on water quality due to sedimentation, and leaching of fertilizers, herbicides, and pesticides in the waterbodies into which the drain tile discharges.

Draining, filling, or pumping of an area that has a watershed, or contributing area of more than 80 acres requires a permit from North Dakota's Office of the State Engineer. However, there has been a significant amount of confusion in our state about whether drain tiling also requires a permit from the State Engineer.

In fact, installing drain tile does require a permit from the State Engineer, when the contributing watershed is more than 80 acres. It is important to understand and account for the fact that the contributing area may be larger than the perimeter of the drain tile. In areas of the state where projects have been deemed to be of statewide significance, such as the Devils Lake basin, tile drainage systems are also subject to those orders.

For questions regarding drain tile permits, contact John Paczkowski, North Dakota State Water Commission at 701-328-3446, or by e-mail at jpaczkowski@nd.gov.

For more information on drain tile, contact Gary R. Sands with the University of Minnesota Extension Service at 621-625-4756, or by e-mail at grsands@umn.edu.



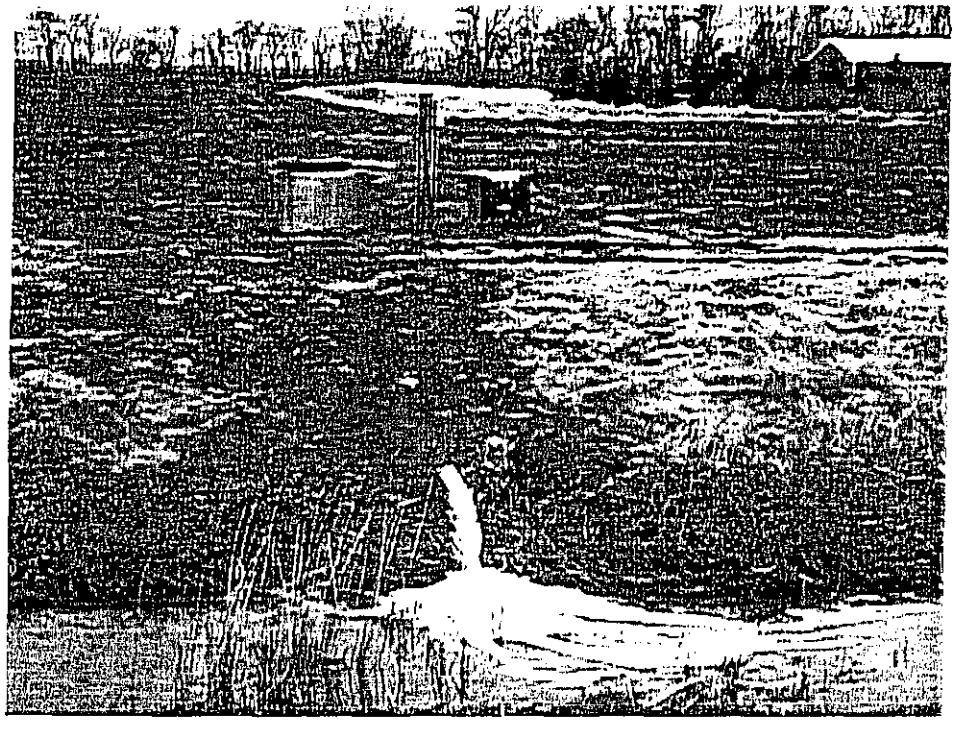
Tile drainage drops the water table, making the soil profile suitable for most crops.

North Dakota State Water Commission
Dale L. Frink, State Engineer
900 East Boulevard Ave. · Bismarck, ND 58505
(701)328-2750 · http: //www.swc.state.nd.us/
Patrick Fridgen, Editor

The State Water Commission does not discriminate on the basis of race, color, national origin, sex, age, or disability in employment or the provision of services.

Potential Effects of Subsurface Drainage on Water Appropriation and the Beneficial Use of Water in North Dakota

RESPONSE to SENATE BILL No. 2020, Section 11
of the 60th LEGISLATIVE ASSEMBLY of NORTH DAKOTA



By
W. M. Schuh
(Cartography by Rod Bassler)

Water Resources Investigation No. 45
North Dakota State Water Commission

2008

Sent: Saturday, March 05, 2011 8:13 AM
To: jeffprintz@bis.midco.net
Subject: article from INFORUM / Fargo Forum

You have been sent this article from jlp

Field tile worsens flooding
Ron Gilmore - 03/05/2011

I am a longtime resident of North Dakota with more than 20 years of living in the Red River Valley. I am the son of a farmer, and owner of farmland as well. I support farming and farmers, but I take great exception to the claims of Sen. Joe Miller, R-Park River, that tiling will reduce flooding (Forum, Feb. 26). First is the claim that tiling does not contribute to flooding because it moves water away during nonflooding times to allow for water to be stored. This may be true during summer heavy rains, as tiling does help control water content in the soil. However, it doesn't help coming out of winter into spring. The depth of the tile is at levels that normally are frozen along with the ground. Thus, no benefit to tiled ground is captured during spring flooding. Just the opposite actually occurs, especially during times of high moisture in the fall as we have seen in recent years. Tiled water is dumped into either manmade drains or natural waterways. What happens when the water is artificially drawn off the land is that these waterways freeze up at levels they normally would not or, in many cases, the waterways would be void of water. A dry or normally running waterway allows for water to start flowing in the spring in a way nature intended. When these waterways are subject to artificial drainage, they freeze up solid because most are not over 3 to 5 feet deep. This creates an ice block plugging the drain. Now water is prevented from moving slowly and normally to the rivers. Instead, what you get is backup and then a big bang when the water cuts through the ice jams. This results in washed out roads, higher crest levels, etc. Let's look further at tiling. Tiling has a negative effect upon wetlands by stopping water from getting to them. Wetlands are nature's filters of our water, allowing slow percolation of water down to the aquifers as they recharge them and removing many of the pollutants along the way. While North Dakota has seen wet years, water levels in many of our aquifers have been dropping as demand for that water increases. Now Miller and others are proposing speeding up the permitting of the most destructive thing to aquifer recharging that we can do. I am for a balance, but this bill tips this balance too far and too fast. and they are trying to do it with smoke-and-mirrors claims about flood control when the state is facing increased flooding in the Devils Lake Basin, three years of flooding along the Red, Sheyenne and many other rivers and streams across North Dakota. Flooding is going to occur, but there is no reason to increase the risk. We all need to think long term on this issue instead of short term. For guidance on what to avoid, all we need to do is look to the areas in South Dakota and Minnesota that have been heavily tiled to see the negative impacts as I stated regarding wetlands and aquifers. Gilmore lives in Fargo.

3/7/2011

RED RIVER JOINT WATER RESOURCE DISTRICT
RESOLUTION OF SUPPORT REGARDING AGRICULTURAL TILE DRAINAGE

WHEREAS, The Red River Joint Water Resource District is a Joint Water Resource District organized under N.D. Cent. Code Chapter 61-16.1-11.

WHEREAS, the Red River Joint Water Resource District's members are Water Resource Districts in the Red River Valley with those powers enumerated in Title 61 of the North Dakota Century Code, including the power and authority to approve and deny drainage permit applications in accordance with Chapter 61-32 of the North Dakota Century Code.

WHEREAS, drainage permit applications that are not "of statewide or interdistrict significance" require Water Resource Districts to conduct certain investigations and reviews before Boards can enter final decisions regarding permit applications, including land ownership, watershed impacted, impacts to downstream landowners, and other items, all in accordance with Chapter 89-02-01 of the North Dakota Administrative Code.

WHEREAS, the North Dakota State Engineer's Office has authority under N.D.A.C. § 89-02-01-08 to process drainage applications, and to forward applications along with any recommendations, comments, or directives to the individual Water Resource Districts responsible for entering final decisions regarding individual drainage permits.

WHEREAS, the North Dakota State Engineer's Office has authority under N.D.A.C. § 89-02-01-09.11 to attach conditions to drainage applications prior to forwarding the applications to the individual Water Resource Districts responsible for entering final decisions regarding individual drainage permits.

WHEREAS, in recent years, the volume of tile drainage permit applications has increased substantially, and the North Dakota State Engineer's Office has imposed enhanced investigative requirements upon Water Resource Districts in response to the issues unique to tile drainage projects.

WHEREAS, in recent years, the volume of tile drainage permit applications has increased substantially, and the North Dakota State Engineer's Office has increasingly attached numerous conditions to tile drainage applications.

WHEREAS, the Red River Joint Water Resource District views the conditions attached to tile drainage applications by the North Dakota State Engineer's office as unnecessary constraints that often limit and interfere with the determinations of local Water Resource Districts which have greater knowledge of the subject watersheds, and better understanding of the impacts of local tile drainage projects.

WHEREAS, due to many of the questionable conditions attached to tile drainage permits by the North Dakota State Engineer's office, the Red River Joint Water Resource District believes local Water Resource Districts should have sole decision-making authority regarding tile drainage impacts and the necessity for downstream flowage easements regarding tile drainage projects.

WHEREAS, soils in the Red River Valley are conducive to subsurface tile drainage, and properly designed and constructed tile drainage projects can remove excess sheetwater to maximize crop yields and land values.

Ohnstad Twichell
attorneys

WHEREAS, the Red River Joint Water Resource District views agricultural tile drainage as a favorable means of managing sheetwater and wishes to voice its support for agricultural tile drainage in the Red River Valley, and its opposition to excessive administrative burdens in the tile drainage permitting process created by the North Dakota State Engineer's Office.

NOW THEREFORE, BE IT RESOLVED that the terms contained in this RESOLUTION represent the Red River Joint Water Resource District's official position regarding agricultural tile drainage.

BE IT FURTHER RESOLVED that the Red River Joint Water Resource District believes that, generally, tile drainage removes excess water from surface soils, and increases the absorptive properties of surface soils as compared to similarly situated untiled soils.

BE IT FURTHER RESOLVED that the Red River Joint Water Resource District believes that, generally, tile drainage improves the absorptive properties of surface soils and therefore increases the potential for rainwater to infiltrate into the ground.

BE IT FURTHER RESOLVED that the Red River Joint Water Resource District believes that, generally, tile drainage increases the infiltration potential of surface soils and that, as a result, tile drainage may reduce and delay the rate of sheetwater surface runoff compared to similarly situated untiled soils.

BE IT FURTHER RESOLVED that the Red River Joint Water Resource District believes that, generally, tile drainage may reduce and delay the peak runoff rate for typical rainstorms and sheetwater, and therefore supports tile drainage as a means of reducing the frequency and severity of summer flooding.

BE IT FURTHER RESOLVED that the Red River Joint Water Resource District generally supports and encourages the installation of agricultural tile drainage in the Red River Valley Watershed as a means of providing summer flood mitigation benefits.

BE IT FURTHER RESOLVED that the Red River Joint Water Resource District supports and encourages landowners to construct agricultural tile drainage projects in accordance with their legal obligations under Chapter 61-32 of the North Dakota Century Code.

APPROVED:

_____
James Lyons, Chair

ATTEST:

_____
Joan Svaleson
Secretary-Treasurer

Date Approved: _____, 2009

OhnstadTwichell

Soil Salinity in North Dakota

Scope, Crop Losses, and Economic Impacts

A synopsis of a white paper by Tom Hanson, Executive Director
North Dakota Association of Soil Conservation Districts

Soil salinity has become a serious problem in North Dakota and has major effects on crop production and farm profitability. Four years ago, Tom Hanson, NDASCD Executive Director, estimated the impacts of salinity based on NRCS mapping data, NDSU Extension bulletins, and research publications. The impacts of salinity can be summarized as:

- Saline soils associated with shallow water tables are the primary issue in eastern North Dakota. Saline seeps and sodic soils are the dominant concern in central and western North Dakota.

- About 2 million cropland acres are affected by salinity in the Red River Valley. An additional 6 million acres of cropland and 6 million acres of rangeland are affected in the rest of the state.

- Crops are damaged by the salts that concentrate in the soil because they are not leached away during the recent wet weather and the resulting high water tables.

- The effect of soil salinity varies from complete crop loss to 20 to 30% yield reductions, which are less noticeable but significant.

- Although a complete economic analysis is not available, total crop losses of $200 million per year in North Dakota were estimated in 2007. These estimates likely underestimate the current losses based on today's crop prices and increases in salinity, both in severity and acreage.

- Additional losses in range productivity, land value, water quality, the lost multiplier effect (crop dollars not being spent in local communities), etc. is difficult to measure, but these losses represent substantially more than the $200 million in lost crop yields.

Summarized by NDSU Extension Service, January 2011